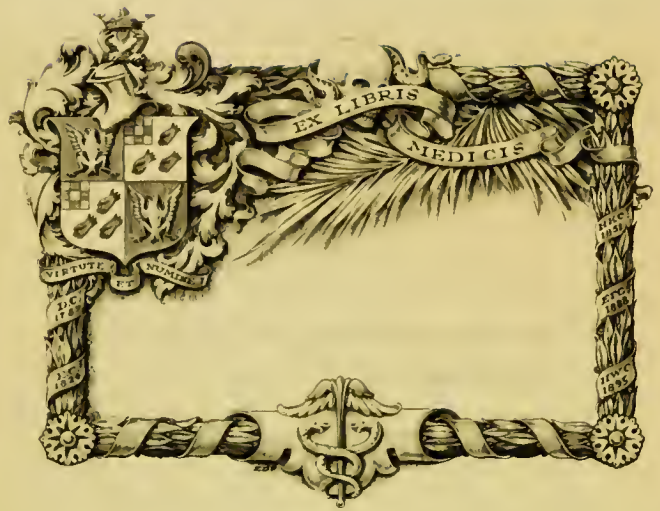
THE INTRODUCTION OF SURGICAL ANÆSTHESIA



With the Compliments of

DR. HODGES.

A NARRATIVE OF EVENTS

CONNECTED WITH THE INTRODUCTION OF

SULPHURIC ETHER

INTO

SURGICAL USE.

BY

RICHARD MANNING HODGES, A.M., M.D.

FORMERLY A SURGEON OF THE MASSACHUSETTS GENERAL HOSPITAL.

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TO

The Officers and Trustees

OF

THE MASSACHUSETTS GENERAL HOSPITAL,

The following pages are respectfully inscribed.

July, 1891.

Even as a Surgeon, minding off-to-cut
Som-cureless limh; before in ure he put
His violent Engins on the vicious member,
Bringeth his Patient in a sense-less slumber,
And grief-less then (guided by Use and Art)
To save the whole, sawes off th' infested part.

DU BARTAS (1544-1590):
Weekes and Workes; Week I. Day 6.

Th' invention all admir'd, and each, how hee
To be th' inventer miss'd, so easie it seem'd
Once found, which yet unfound most would have thought
Impossible.

PARADISE LOST,
Book VI. Lines 496-499.

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THE INTRODUCTION

OF

SURGICAL ANÆSTHESIA.

THE discovery of Surgical Anæsthesia was a surprise. Its advent was marked by no tentative steps. It appeared to have had no preliminary, experimental stage, but burst like a revelation upon the medical profession, as well as the community, virtually in the fulness of perfection, when the first successful demonstration of its practicability was made known.

For this reason, and because a bitter dissension quickly arose as to whom the credit of the discovery should be accorded, it may not be superfluous to recall and preserve the details of the occurrence, — especially as many of the incidents have probably been forgotten, and are of a nature to be interesting to all physicians, more particularly to those in this immediate vicinity. The principals in the dramatic event have died. A

new generation has come upon the stage, and in its turn is passing away. Of the surgeons of the Massachusetts General Hospital present when the first operation under ether was performed, not one is now living.

The confusion in which argument and counter-argument have left the Ether controversy, renders it impossible to chronicle the incidents by which the discovery was attended without laying oneself open to protest, either on the ground that some things are unfairly assumed to be matters of fact, or that inferences have been drawn from one-sided reasoning and discussion. In this brief account of the introduction of ether, however, nothing is set forth without the justification of corroborative evidence. It reasserts that Dr. Morton was the discoverer of practical anæsthesia, and simply rehearses an old story, largely from personal points of view and in its Boston relations.

It has not seemed wise to encumber the text with references, or always, even when the words of others have been literally appropriated, to note the fact by quotation marks.

Dr. W. T. G. Morton.

William Thomas Green Morton was born in Charlton, Worcester County, Massachusetts, August 9, 1819. After receiving a New England common-school education, he came to Boston at the age of seventeen. Here he acted as clerk and salesman in various places of business; but finally betook himself to Baltimore, Maryland, where he began the study of dentistry, in the College of Dental Surgery. In 1841–42 he began business at Farmington, Conn. There he became acquainted with Horace Wells, an exceptionally skilful dentist of an inventive turn of mind, who was then living in Hartford. In 1842–43 these two dentists formed a partnership, and established themselves in practice in Boston.

This partnership proving unremunerative, it was amicably dissolved in the autumn of 1843; Wells returning to Hartford, and Morton remaining in Boston, having an office at 19 Tremont Street. In March, 1844, he entered his name as a student of medicine in the office of Dr. Charles T. Jackson. With his newly married wife, Morton resided in that gentleman's family during the ensuing summer. In the

autumn of 1844 he matriculated at the Medical School of Harvard University, taking out a complete set of tickets for the lectures of the winter of 1844–45. The necessity for self-support, however, compelled him to give his attention chiefly to his dental business; and this, together with his discovery of the use of ether, so interrupted his studies that he never graduated. In 1849, three years after the introduction of ether, the honorary degree of M. D. was conferred upon him by Washington University, Baltimore.

Initiative Steps.

While he was associated with Horace Wells, Dr. Morton became possessed of a new and peculiar solder for fastening artificial teeth to the gold plate, the only kind of plate then used. This was regarded as a distinct advance in mechanical dentistry; but as its advantageous use required the removal of all the old roots from the jaws, and as patients refused to subject themselves to the pain of this process, which was not imposed by other dentists, Morton had the mortification of seeing clients leave his office and procure their false teeth elsewhere.

This led Dr. Morton to seek for some method of painless extraction. He tried every expedient within his knowledge in order to accomplish this object. He persistently experimented with alcohol, with laudanum in large doses of three hundred drops, with opium in powders of ten or twelve grains each, and even with animal magnetism or mesmerism; but met only with failure and discouragement.

In July, 1844, Miss Parrott, of Gloucester, Massachusetts, called at Dr. Morton's office to have a tooth filled. It was extremely sensitive; and to deaden the pain, he made use of some carefully prepared chloric ether, which his preceptor, Dr. C. T. Jackson, had told him he had successfully employed, as toothache drops, when in general practice. Dr. Jackson had even sent phials of chloric ether to Dr. Morton and to two other dentists of Boston, recommending it for killing the nerves of decayed teeth, instead of arsenic, then commonly adopted for that purpose. Its apparently beneficial effect when used upon Miss Parrott's tooth, decided Dr. Morton to learn all he could about a drug which was apparently so efficacious in producing a benumbing influence when locally applied.

Wells's Use of Nitrous-Oxide Gas.

On December 10, 1844, G. Q. Colton, a public lecturer, whose name is identified with laughing or nitrous-oxide gas, gave at Hartford one of the popular exhibitions with which he was then travelling through the country, of the amusing effects produced by the inhalation of this now familiar gas.

On the following day, December 11, at a private exhibition held at the request of several gentlemen, Samuel A. Cooley, while under the influence of the gas, ran against some settees, was thrown down, and badly bruised in the knees, — but for the time being remained unconscious of the injury.

This fact so impressed Morton's former partner, Horace Wells, who was present, that he was led to remark: "A person might have a tooth extracted while under the influence of this gas, and not experience any pain." Wells further said that he had a tooth which troubled him exceedingly, and that if Colton would fill his bag with the laughing gas, and go with Wells to his office, he would try the experiment. Colton acquiesced. Wells inhaled the gas; and one of

his upper molar teeth was painlessly extracted by Dr. John M. Riggs, another Hartford dentist. As the effects of the gas subsided, Wells exclaimed: "A new era in tooth-pulling! It is the greatest discovery ever made! I did n't feel it as much as the prick of a pin!"

Wells straightway followed up this personal experiment by extracting several teeth, four in all, from different individuals, and speedily entered into an informal arrangement with Mr. Cooley, already referred to, who was a druggist in Hartford, to establish a business exclusively for the extracting of teeth without pain by means of nitrous oxide gas.

In pursuance of this scheme Horace Wells came to Boston in January, 1845, and attempted to give an exhibition of painless tooth-pulling, in presence of a number of physicians and students, Dr. Morton aiding him with his instruments and advice. Wells administered the gas and extracted a tooth; but the patient screamed with pain, and the spectators laughed and hissed. The failure to produce insensibility was so complete that the effort was regarded as an imposition. Wells attributed his misadventure to the fact that the gas-bag was withdrawn too soon from the patient's mouth; but the true reason

was, as subsequently shown, that Wells, following Colton's instructions, had administered only the ordinary exhilarating dose, — an amount of gas insufficient to assure anæsthesia. Failing to recognize the necessity of a larger dose, Wells narrowly missed making a great discovery.

The non-success of this attempted demonstration was so completely discouraging, that Wells went home and told his friends that the gas would not work as he had hoped, and that there was no dependence to be placed upon it, inasmuch as it did not produce the same effect in all cases. Shortly afterward Wells gave up dentistry for other pursuits, and from the date of his Boston visit he abandoned further experiment with nitrous-oxide gas, until his return from Europe in 1847, two years later.

Experiments with Ether.

When Wells was in Boston, however, he saw and conversed with Dr. Morton. It is in evidence that, stimulated by this rival endeavor to deprive tooth-pulling of its agony, Morton again actively occupied himself with the subject, and twice during the year 1845 he visited Wells, in Hartford, to inquire about nitrous oxide.

Nitrous-oxide gas and ether had long been known to produce similar effects. In 1818, an article believed to have been written by Faraday stated that —

"When the vapor of ether mixed with common air is inhaled, it produces effects very similar to those occasioned by nitrous oxide. . . . A stimulating effect is at first perceived in the epiglottis, but soon becomes very much diminished; a sensation of fulness is then generally felt in the head, and a succession of effects similar to those produced by nitrous oxide. . . . It is necessary to use caution in making experiments of this kind. By the imprudent inspiration of ether a gentleman was thrown into a very lethargic state, which continued, with occasional periods of intermission, for more than thirty hours, and a great depression of spirits; for many days the pulse was so much lowered that considerable fears were entertained for his life." [1]

Whoever thought, therefore, of one of these agents, either as an exhilarator or an anæsthetic, must naturally think of the other. Morton argued in his mind somewhat after this fashion: "If ether, rubbed or laid upon the mucous mem-

[1] Journal of Arts and Sciences, No. VII. vol. iv. p. 158. 1818.

brane, or placed in contact with an exposed nerve, will produce such an amount of local insensibility as occurred in Miss Parrott's case, what prevents its use in larger quantities, and upon a more extended surface of membrane, so as to produce general insensibility? But how is this to be done? Why not by the same method as with nitrous oxide gas? Ether is nearly as volatile as gas. It can be inhaled, — taken into the lungs. Then it will at once be applied to a surface of mucous membrane greater than all in the rest of the body put together. Moreover, it will reach the most favorable point for its effects, — a point where the blood is prepared and rendered fit for use in all parts of the body."

In the spring of 1846, Mr. Thomas R. Spear, Jr., a student in Dr. Morton's office, still further stirred his instructor's zeal by describing to him his own personal experience in inhaling sulphuric ether for amusement, while a scholar at the Lexington Academy. Though he had found it exhilarating in a high degree, no unpleasant effects had followed its inhalation.

In the course of the ensuing summer, Morton undertook to etherize a goldfish. At first he thought he had killed it, but it swam away when

put back into the water. He also etherized a hen; and then cut off her comb, without perceiving any indication that it gave her pain. He held the head of Nig, a pet spaniel in his family, over a pan in which he had placed some loose cotton saturated with sulphuric ether. The animal became partially insensible, and was ever afterward afraid of his master. Dr. Morton also made himself deathly sick by taking ether and opium experimentally. On one occasion his mother found him half insensible from inhaling ether. It greatly alarmed her, and she remonstrated with him for his recklessness.

In June, 1846, Morton arranged with Grenville G. Hayden to superintend the business of his office, confiding to him as his reason for so doing that he had discovered something which would enable him to extract teeth without pain, and that this discovery would require all his time and attention. He made a similar statement to Richard H. Dana, Jr., his lawyer, when the agreement between himself and Hayden was drawn up.

Early in the following August, having just obtained a bottle of ether from Joseph Burnett, the well-known apothecary on Tremont Street, who was much trusted by the medical profession,

Morton requested Hayden to inhale its vapor. This Hayden declined to do. Morton accordingly took the ether with him to Needham, where he then lived, and was in the act of giving it to his former patient the spaniel, when that animal, excited by the inhalation, escaped from control, upset the bottle, and spilled all but a small quantity of its contents. Morton, saturating his handkerchief with what remained, breathed it himself, in deep inspirations. A feeling of lassitude came over him, followed by a complete but momentary state of unconsciousness. "I am firmly convinced," he said, "that in that moment a tooth might have been drawn with no sensation of pain."

As he purchased his ether in small quantities, — four ounces, usually, — Morton became apprehensive that his secret would be discovered if he continued to procure the drug always at the same store. He therefore despatched one of his students to the well-known wholesale house of Brewer, Stevens, and Cushing, on Washington Street, and obtained half a gallon of ether.

Restless and impatient for a human subject to experiment on, he endeavored to persuade his student, Spear, to breathe some ether; but he decidedly objected. At last, however, satisfied that

this was the same article which had been used at the Lexington Academy, Spear consented to try it again. He grew gradually drowsy and stupid, and became so far insensible as to drop the handkerchief from which he was inhaling the vapor. Then he became excited and furious, and had to be held in his chair. Ether from the same bottle was also given to another of Morton's students, Mr. Leavitt, with a similar effect.

Disappointed and puzzled to understand why similar results were not produced on these young men as on himself, the idea occurred to Morton that the quality of this ether was not the same as that obtained of Mr. Burnett. He therefore had it examined by Dr. Martin Gay, a chemist, who told him that it was unrectified or commercial ether, containing "more impurities than is usual in the best ethers, not far from a quarter part of the liquid being free alcohol."

At that date pure washed (or rectified) sulphuric ether was scarcely to be found outside a chemist's laboratory. Few druggists kept it, unless, like Mr. Burnett, they sold the highest grade of drugs and chemicals. There is reason to think that if the ether administered to Spear and Leavitt had been of better quality, the dis-

covery of surgical anæsthesia might then have been made.

Satisfied that he stood on the verge of a long-sought discovery, Morton made fruitless attempts to hire some one to have a tooth pulled. He sent Mr. Spear out in search of a patient willing to be etherized, and promised to pay him if he found one. Meanwhile Morton held various interviews with Mr. Burnett, and also with Mr. Metcalf, another greatly respected druggist, about the purity and qualities of ether, giving them no hint as to the motive of his inquiries. Mr. Metcalf went to Europe shortly afterward; but he was so impressed by these conversations, that when the Ether discovery was announced to him in Italy, and ascribed to an unnamed Boston dentist, he knew at once that Morton must be the man.

Several times during September, 1846, Morton also visited the establishment of Joseph M. Wightman (subsequently Mayor of Boston), a maker and vender of philosophical and chemical instruments, in search of inhaling-apparatus suitable for the administration of ether. He asked for "something made for retaining gas," but kept Wightman in the dark as to the ulterior object of this request. But the latter detected

the odor of ether in Morton's clothes, and on one occasion, which he identified as September 28, 1846, he spoke of him to his wife as "a dentist who was making experiments about extracting teeth without pain;" adding, "He thinks I don't know what he means to use for this purpose, but I do; it is sulphuric ether." The question arising at one of these visits as to the effects of ether upon an oil-silk bag, Mr. Wightman, disclaiming for himself any practical knowledge of the matter, advised Morton to seek information from Dr. Charles T. Jackson, the principal chemical authority in the city.

Interview with Jackson.

On September 30, apparently in consequence of Mr. Wightman's suggestion, Morton went to Dr. Jackson's office. Dr. Jackson lived on Somerset Street, just below the present Court House. His laboratory adjoined his house, and attracted a good many students of chemistry. Indeed, there was much free-and-easy going and coming both of past and present pupils, Dr. Jackson being a companionable and affable man. Morton was especially at home here, both as an old pupil and as a former inmate of Jackson's

family, and had since been in the habit of consulting him from time to time. His story to Dr. Jackson was this: He had a refractory patient, and desired the loan of a gas-bag, intending to make her inspire pure air from it, and by the impression thus made on her imagination to bring her under control and extract her tooth. Dr. Jackson rather laughed at Morton's proposal, but said, after some talk about mesmerism and nitrous oxide, that if Morton would try ether, and make his patient breathe that, he could do with her what he pleased. Morton asked what ether was, — if it was a gas; and he requested to see some of it.

That this was simply a ruse on Morton's part is shown by the sworn testimony of Theodore Metcalf, that, previous to July 6, 1846, on which date Metcalf sailed for Europe, he had a conversation with Morton, in Mr. Burnett's store, in regard to the nature and effects of sulphuric ether, a quantity of which Morton was then purchasing, and a bottle of which he held in his hand. Mr. Wightman's evidence also shows that Morton, before going to Dr. Jackson's, had provided himself with some sort of apparatus for inhaling ether, and had spoken of what he

was engaged upon as "of great importance in his profession."

When Morton requested Dr. Jackson to show him his ether, and smelled of the bottle taken down from the laboratory case as though he had never seen the substance before, Jackson remarked that it had been standing on the shelf for some years, and might have deteriorated. He therefore advised Morton to go to Burnett's and get some strong, rectified sulphuric ether (the stronger the better), to pour some of it on his handkerchief, which he should then put to his patient's mouth and nose, and take care that the ether was thoroughly inhaled. Dr. Jackson even went through the motions to show how ether was to be used, and it is said urged Morton to try it on himself. He made light of the inquiry if there was danger in the use of ether, by saying: "It won't do any harm. College and school boys often amuse themselves by breathing it, and I have tried it myself."

Practical Anæsthesia.

On Morton's return, having obtained a bottle of ether at Mr. Burnett's, he seated himself in his office chair, and administered to himself, in-

stead of the mythical patient he had pictured to Dr. Jackson, a strong dose of ether vapor. He says: "I looked at my watch, and soon lost consciousness. As I recovered, I felt a numbness in my limbs, with a sensation like nightmare; and I would have given the world for somebody to come and arouse me. I thought, for a moment, I should die on the spot in that state, and the world would only pity or ridicule my folly. At length I felt a slight tingling of the blood in the end of my third finger, and made an effort to touch it with my thumb, but without success. At a second effort I touched it, but there seemed to be no sensation. I attempted to rise from my chair, but fell back. Gradually I regained power over my limbs, and full consciousness. I immediately looked at my watch, and found that I had been insensible between seven and eight minutes."

In the evening of that day Mr. Frost, a stout healthy man, by occupation a musician, came into Dr. Morton's office suffering great pain, and wishing to have a tooth extracted. He was timid, and asked to be mesmerized. Dr. Morton replied that he had a better application than mesmerism, and proposed to use it. Without much inquiry, on the assurance that it was

safe and would destroy the pain attending the operation, Mr. Frost consented to the process. Thereupon Dr. Morton saturated a folded cloth with ether, and held it to the man's mouth and nose until he was unconscious. In less than five minutes after the patient had taken his seat in the operating-chair the great discovery was achieved. It was so dark that Dr. Hayden held a lamp for Dr. Morton while the firmly rooted bicuspid was extracted, never imagining how near his assistance came to defeating the discovery and contributing to a catastrophe, by the ignition of the inflammable vapor. Mr. Frost quickly recovered, asked the number of the street, and said he never felt so happy in his life. On finding his tooth already extracted, he declared that he had suffered no pain whatever. He even remained sometime talking about the occurrence, and at Morton's request, before leaving, wrote the following certificate : —

This is to certify that I applied to Dr. Morton this evening at eight o'clock, suffering under the most violent toothache ; that Dr. Morton took out his handkerchief, saturated it with a preparation of his, from which I breathed about half a minute, and then was lost in sleep. In an instant more I awoke, and saw my tooth lying on the floor. I did not

experience the slightest pain whatever. I remained twenty minutes in his office afterward, and felt no unpleasant effects from the operation.

EBEN H. FROST.

BOSTON, 42 Prince Street, Sept. 30, 1846.

We witnessed the above operation, and the statement is in all respects correct. And, what is more, the man asked where his tooth was, or if it was out.

A. G. TENNEY, *Journal Office.*
G. G. HAYDEN, *Surgeon Dentist.*

The first public notice of this first surgical operation in which the pain was successfully prevented by the use of ether, appeared in the "Boston Daily Journal" of October 1, in the following terms: —

"Last evening, as we were informed by a gentleman who witnessed the operation, an ulcerated tooth was extracted from the mouth of an individual without giving him the slightest pain. He was put into a kind of sleep, by inhaling a preparation, the effects of which lasted for about three quarters of a minute, just long enough to extract the tooth."

On the day following this successful experiment upon Mr. Frost, Morton again called upon Dr. Jackson, told him what he had done, talked with

him about the best means of giving ether, and asked him for a certificate that it might be inhaled with safety. Dr. Jackson declined making himself responsible in writing. Dr. Morton also advised with Dr. Jackson, as well as with Dr. Hayden, in regard to the best method of bringing his discovery to the attention of the medical profession and the public. Dr. Jackson said: "People will not be convinced of the insensibility to pain by a mere tooth-extraction, since it is very common for patients to say that pulling does not hurt them, when the twitch is very sudden, and the operation skilfully performed. This proof would not be considered by the public as satisfactory."

As the result of these various conferences the obvious conclusion was reached that proper publicity for the new discovery could be attained only through the agency of some leading surgeon, by the performance of an impressive operation in the presence of numerous spectators.

The Massachusetts General Hospital, the sole hospital in Boston at that time, naturally suggested itself as the desirable place for such an exhibition. Morton objected that this step would betray the nature of the article used, as its odor was so characteristic, but was assured

that this could be effectually disguised by adding to the ether what was called French Essence. Accordingly, two or three days after the operation on Mr. Frost, Dr. Morton called upon Dr. John C. Warren, one of the surgeons of the hospital, and told him that he had discovered something which would prevent pain from being felt during a surgical operation. He did not say what it was, but begged for an opportunity to employ it in some case in which Dr. Warren might be the operator. Dr. Warren, having had a general acquaintance with Dr. Morton for a year or two before this time, listened to this communication as to one of importance and magnitude, and promised, although unable at the moment to comply with the request, to do so on the first occasion which offered.

Demonstration in Public.

At no time in the course of its history had the Massachusetts General Hospital been so prosperous as at the period now reached. Extensive improvements projected a few years previously, and which the generosity of the public had rendered practicable, were nearly completed. In May, 1846, a new west wing had been opened

for patients; and in July, 1847, a new east wing was completed. These additions enabled the Hospital to accommodate one hundred and fifty patients instead of sixty; in other words, the Hospital's capacity for usefulness was nearly trebled.

In 1846 the medical staff consisted of Jacob Bigelow, Enoch Hale, John B. S. Jackson, Henry I. Bowditch, John D. Fisher, and Oliver Wendell Holmes, the last three being new appointments. The surgical staff consisted of John C. Warren, George Hayward, Solomon D. Townsend, Henry J. Bigelow, J. Mason Warren, and Samuel Parkman. Up to the time of the introduction of ether the three gentlemen last named, — also newly appointed, — had not been assigned their terms of service, owing to the still unsettled condition of the recently constructed wings, although they exercised all the functions of their office in operations, consultations, etc. The new appointments, both medical and surgical, were due to the enlargement of the Hospital, and dated from January 28, 1846.

On the morning of October 13, 1846, a young man named Gilbert Abbott, twenty years old, by occupation a printer, — a thin tall man, and al-

ways weak and sickly, frequently obliged to give up work on account of ill-health, and inheriting phthisical tendencies from both parents, — was brought into the operating theatre of the Hospital to undergo an operation for the removal of a congenital, but superficial, vascular tumor just below the jaw, on the left side of the neck. All the arrangements for its performance having been completed, Dr. J. C. Warren was about to begin, when he paused and said: "I now recollect that I promised Dr. Morton to give him the earliest opportunity of trying a mode for preventing pain in surgical operations; and if the patient consents, I shall defer this operation to another day, and invite Dr. Morton to administer his preparation." The patient naturally approved of this proposal, and the operation was postponed to the following Friday, October 16.[1]

On October 14 Dr. Morton received the following note: —

Dear Sir, — I write at the request of Dr. J. C. Warren, to invite you to be present on Friday morning, at ten o'clock, to administer to a patient, then

[1] See Deposition of J. M. Warren. Answer to Interrogatory 6.

to be operated on, the preparation which you have invented to diminish the sensibility to pain.

Yours respectfully,

C. F. Heywood,
House Surgeon to the M. G. H.

While these events were taking place, Morton was greatly befriended by Dr. Augustus A. Gould, who lived nearly opposite his office, where the Boston Museum now stands, and with whom he subsequently boarded, from October or November, 1846, for two or three months. In August or September Dr. Morton had called upon Dr. Gould at Dr. Jackson's instigation, and conversed with him about his (Morton's) improvements in dentistry, especially his anticipation of being able to extract teeth painlessly. He made a profound impression on Dr. Gould's mind by the emphasis with which he declared: "I will have some way yet by which I will perform my operations without pain." Being of a kind and sympathetic nature, Dr. Gould aided and advised Morton in various ways.

Dr. Jackson, at one of Morton's visits, had arranged for him an extemporary inhaling apparatus, consisting of a large glass flask, with a bent glass tube three feet long. This having

proved ineffectual, Morton substituted a glass funnel-shaped tube obtained from Mr. Wightman. Both of these appliances had one objectionable feature, — that the patient breathed back the expired air. On the evening previous to the first case of etherization at the Hospital, Dr. Gould drew a sketch of an inhaler, with a valve intended to obviate this defect. He advised Morton, however, to run no risks on the following day, but to employ the means to which he was accustomed. Nevertheless, Dr. Morton had the inhaler made, and used it at the Hospital. This instrument consisted of a glass globe with two necks, one of which was stopped with a cork, along the sides of which deep grooves were cut to admit air freely into the globe, and thus mix with the vapor from a sponge placed inside, and liberally saturated with ether; while to the other neck a tube was attached, containing a valve which was opened by the patient's inspiration, and closed again by his succeeding expiration.

Having been notified as above stated, to be at the Hospital early on Friday morning, Morton rose at daybreak, went to N. B. Chamberlain, a well-known instrument-maker, whom, by great urgency, he had persuaded to undertake the

novel task of making this inhaler.[1] It was not quite completed when he called for it, just before the hour appointed for the operation. Fearing he should be late, Morton finally seized it from the workman's hands, and started for the Hospital, accompanied by Mr. Frost, whom he took with him to conduce in some way to Morton's relief in case of failure, and to act as a voucher in regard to what Morton had already accomplished.

At the Hospital, on this Friday morning, October 16, Dr. Warren, having waited ten or fifteen minutes, turned to those present, and said: "As Dr. Morton has not arrived, I presume he is otherwise engaged," apparently conveying the idea that Morton did not intend to appear. This remark occasioned a laugh. Dr. Warren then sat down by his patient. Just as he raised his knife to begin, Dr. Morton entered with his inhaler.[2]

Dr. Gould had advised Morton to tell Dr. Warren what substance he proposed to use, as

[1] That the first *inhaler* (properly so designated) used for the anæsthetic administration of ether was made by Mr. N. B. Chamberlain, is proven by the statement of Dr. Morton himself, in the Memoir attached to the Hon. W. H. Bissell's Congressional Report (pp. 52, 53), as well as by the Deposition of G. G. Hayden (p. 195).

[2] See Deposition of A. A. Gould. Answer to Interrogatory 22.

it would partly divide the responsibility, and he might be sure that Dr. Warren would not abuse his confidence. Dr. Morton said that he would do so; but he arrived so late at the Hospital that he had no opportunity to make the communication at that time.[1]

Having completed his preparations, — that is, having added to the ether the Eau de Mille Fleurs, the Oil of Neroli, or some essence of the sort, and (as one of the surgeons says) set fire to some Cascarilla Bark, — preparations which then and subsequently were made privately in a room behind the seats of the amphitheatre, — Morton proceeded to administer his compound.

"Are you afraid?" he said to the patient. "No," replied the young man; "I feel confident, and will do precisely as you tell me." Pointing to Mr. Frost, Morton remarked, "There is a man who has breathed it, and who can testify to its success." The spectators looked on incredulously, especially as the patient at first became exhilarated; but suddenly, when his unconsciousness was evident, there was a start of surprise.

[1] See Deposition of A. A. Gould. Answer to Interrogatory 24.

Dr. Morton then calmly informed Dr. Warren that his patient was ready. As the operation progressed, the utmost silence prevailed. Every eye was fixed upon the novel scene, in eager expectancy and amazement. During the latter part of the operation the patient was sufficiently conscious "to move his limbs, and to utter extraordinary expressions; and these movements seemed to indicate the existence of pain, but after he had recovered his faculties he said he had experienced none, but only a sensation like that of scraping the part with a blunt instrument."[1] This somewhat imperfect insensibility arose from the fact, that, as the operation had taken longer than was anticipated, Morton had several times removed the inhaler from the young man's mouth. While the patient was still lying on the table, Dr. Warren turned to the audience and said, slowly and emphatically, "Gentlemen, this is no humbug." He then remarked that a satisfactory test of the preparation could be made only by repeated trials, and ended by asking Dr. Morton to come to the Hospital and administer it again on the following day.[2]

[1] See Hospital Records.

[2] See Deposition of A. A. Gould. Answer to Interrogatory 23.

This first operation occupied about five minutes of time. It was certainly incomplete as a demonstration. There were manifest signs of consciousness during the dissection, which was not perhaps of the most painful description. A powerful drug — or even the imagination, as it was said — might have been an adequate agency in producing the phenomena observed. Dr. J. C. Warren himself says it should be "placed in the class of cases of imperfect etherization."[1] The impression made upon observers was nevertheless profound enough for Dr. H. J. Bigelow to say to a physician whom he met as he left the Hospital, "I have seen something to-day which will go around the world."

"The day of this first operation at the Hospital," says Mrs. Morton, "is one of the marked days of my life, never to be forgotten, — with its suspense from four o'clock in the morning, when my husband left me to go to the instrument-makers, until late in the afternoon, when he returned with the look of success in his face."

On the following day, October 17, a woman, an out-patient, presented herself at the Hospital,

[1] Etherization, with Surgical Remarks (p. 6), by John C. Warren, M. D. Boston, 1848.

with a fatty tumor of considerable magnitude on the right shoulder. Dr. Morton again administered his preparation. The most complete and passive insensibility attended the removal of this growth. Dr. George Hayward, who had not been present on the preceding day, performed the operation. It occupied seven minutes. As it involved incisions of the skin on a somewhat large scale, it was in the matter of cutting as experimentally satisfactory as an amputation would have been. No delusion of the imagination could be suggested on this occasion. The drooping eyelids, the head fallen on the shoulder, the relaxation of the mouth, indicated nothing but the familiar phenomena of the profoundest sleep; and for the first time the power of the new agent was conclusively shown.

Dr. Morton at once wrote to his old partner, Horace Wells, — sure of his interest, — announcing the discovery he had made. In reply he received the following letter: —

HARTFORD, CONN., Oct. 20, 1846.

DR. MORTON:

DEAR SIR, — Your letter, dated yesterday, is just received; and I hasten to answer it, for fear you will adopt a method in disposing of your rights which will defeat your object. Before you make

any arrangements whatever I wish to see you. I think I will be in Boston the first of next week, — probably Monday night. *If the operation of administering the gas* is not attended with too much trouble, and *will produce the effect you state, it will undoubtedly be a fortune to you, provided it is rightly managed.*

Yours in haste,

H. Wells.

Dr. Henry J. Bigelow, introduced by Dr. Gould, was from the day of the first Hospital operation, — that being his first knowledge of the discovery, — a constant visitor at Morton's office, to witness and study the application of the new agent. Already, in 1837, while in college, Dr. Bigelow had himself made gasometers of nitrous oxide gas, for common diversion and exhilaration; and he had also learned that ether — the odor of which he had quickly detected in Morton's preparation — was equally conducive to this result. He was therefore only the more eager to find out the essential ingredient of the secret compound. Without delay he sent to Philadelphia to procure a quantity of Oil of Wine. This (and, pending its arrival, chloric and sulphuric ether, as well as alcohol, cold and warm) he administered, privately and alone, to

Dr. John C. Dalton, afterward Professor Dalton, House Surgeon at the Hospital, and to others, using for the purpose a two-necked bottle, to one orifice of which was attached a large tin tube provided with leathern valves. The length and material of this tube condensed the vapor, and caused, as Dr. Bigelow thought, his failure when sulphuric ether was employed. The subjects of these experiments were tranquillized in some instances, and lost their inclination to speak or move; in other cases they became excited.

Early Stumbling-blocks.

Dr. Morton is said to have administered ether during these early days of its use with self-possession, method, and caution, — in great contrast to the profuse use of it at a later date. In his letter written to Horace Wells immediately after the first Hospital operation, Dr. Morton says: "I have used the compound without a single failure in over one hundred and sixty cases in extracting teeth."

It cannot be assumed, however, that this had been done always with absolute freedom from pain. The primitive inhaling apparatus em-

ployed was too much at fault to permit such a degree of good fortune. Dr. G. G. Hayden, Morton's assistant, in his deposition, says that after the first successful extraction, September 30, 1846, in which the ether was given by means of a folded cloth, "we tried repeated experiments with the same means subsequently, and they all resulted in total failures;" and he adds that it was only after Dr. Morton procured from Mr. Wightman "a conical glass tube, with which, by inserting a sponge saturated with ether in the larger end, we had better success, that our experiments began to assume a more promising aspect."

Occasional failures and unpleasant effects in no way discouraged Dr. Morton. By reason of the nearness of his residence, Dr. Gould was greatly relied upon in the emergencies which occurred in Morton's office; and he testifies that he was called to six or eight patients whose symptoms were apparently dangerous. One was in a state of high excitement, "almost a maniac." After being carried to Dr. Gould's house she was unable to go home for several hours, and remained in a hysterical condition for two or three days. Other patients vomited profusely. One or two became lethargic, and

were roused with difficulty. Some unpleasant features, such as the suffocating effects of the first inspirations, which were so frightful to these uninitiated pioneers, would occasion little or no alarm at the present day.

One of the very earliest operations, prior to the first capital operation,[1] was by Dr. John H. Dix, an oculist of that day. It consisted in a protracted but limited dissection of tissues near the eye. The inhalation was continued for thirty minutes, and was the first instance of a prolonged anæsthesia; but it was carried on with so little appreciation of the possibility of over-etherization that death would probably have resulted, if Dr. H. J. Bigelow, who was present, had not stopped its further progress while the operation was still far from completed. The hands were cold, the respiration was very slow, and the pulse barely perceptible. The patient was etherized almost beyond recovery. It was then, for the first time, observed and pointed out by Dr. Bigelow that the pulse stood as a beacon between safety and danger, — between a harmless and a fatal narcotism. It was, in fact, the discovery of the safe use of ether.

[1] See Deposition of H. J. Bigelow. Answer to Interrogatory 6.

First Capital Operation.

After October 16 and 17 the use of Dr. Morton's discovery was discontinued at the Hospital. On November 1 Dr. George Hayward began his term of service as visiting surgeon. On Friday, November 6, at Dr. Bigelow's instigation, Morton applied to Dr. Hayward for permission to administer the new anodyne for an amputation above the knee, which he had understood was to be performed in a day or two. Dr. Hayward's response was, that it had been determined not again to use Morton's compound unless he would make known to all the surgeons of the Hospital the nature of its composition, and they should become satisfied that it might be inhaled with safety.[1] Morton said he had no objections to giving Dr. Hayward this information, nor to allowing it to be communicated to his colleagues; but that he wished it to go no further at present, as an application for a patent was pending. Dr. Morton then told Dr. Hayward what his discovery was, and the latter asked to have a written statement of its nature. To this Morton assented, and promised to attend to it in the

[1] See Deposition of J. C. Warren. Answer to Interrogatory 17.

course of the day. Dr. Hayward then suggested that it would be advisable to address his note to Dr. John C. Warren, as he was Senior Surgeon of the Hospital.[1]

In pursuance of Dr. Hayward's suggestion, Morton wrote to Dr. Warren, formally communicating to him the nature of the new discovery. Notwithstanding this, Dr. Hayward, after an interview with Dr. Warren, notified Morton that he need not put himself to the trouble of attending upon the occasion of the amputation, as it had been decided not to allow the new anodyne to be administered.[2]

Cognizant of all these obstructive circumstances, Dr. H. J. Bigelow,[3] on November 7, made an arrangement with Dr. Morton to accompany him privately to the Hospital, just before the hour of the expected operation, assuring him of his intention to do all in his

[1] See Some Account of the first use of Sulphuric Ether by Inhalation in Surgical Practice, by George Hayward, M.D., p. 3. Also, Deposition of G. Hayward, Answer to Interrogatory 5.

[2] See A History of the Discovery of Surgical Anæsthesia. American Journal of the Medical Sciences, January, 1876, p. 179.

[3] See Deposition of H. J. Bigelow. Answer to Interrogatory 6.

power to induce the surgeons then in service to use this preparation in the important case of that day. Dr. Bigelow says: "I called for him in my chaise, and took him, with his inhaler, to the Hospital. Leaving him in the small room adjoining the apothecary's shop, I sought an interview with the surgeons, all of whom were present, assembled in the operating theatre, and I found them decided not to use the ether, their objections being something connected with the professional etiquette of this community. Such objections lay, at that time, against both the patent right connected with the ether, and the concealment, in part, of its character. I then went downstairs and prepared Morton for his impending disappointment. On returning to the amphitheatre I reopened the subject. Conversing chiefly with Dr. Hayward, I said that a certain *éclat* would attend the successful event of the first amputation, which was by right due to the Hospital; and, among other things, that this was not a question of etiquette, but of humanity. In reply to the objection that the new agent was still secret, I reminded Dr. Warren that I believed Dr. Morton had addressed him a letter, disclosing in form that the agent was sulphuric ether. Dr. Warren then took

from his pocket a letter, which, if I remember aright, he read, in part, to the class and those standing near. This letter was then made the turning-point in their decision, — Dr. Warren having admitted that its engagements had been complied with by Dr. Morton; and the surgeons immediately interested in the patient now agreed that ether should be administered to her."

It was then suggested that Morton, whose presence in the Hospital was unknown to any one except Dr. Bigelow, could not be brought to the operation in season, and that it would be impossible to await a search for him, — as, in pursuance of the intention that the patient was to undergo the amputation without ether, one hundred drops of laudanum had already been administered to her. But upon Dr. Bigelow producing Dr. Morton at once, the last objection was overcome.

The operating theatre was crowded with students, physicians, and surgeons of the city and neighborhood, besides clergymen, lawyers, and others, — two or three hundred in number. Dr. Hayward addressed the assemblage, and stated that with the advice of his colleagues he should allow the patient he was about to operate on to

inhale a vapor which was said to have the power of annulling pain.

The patient — Alice Mohan, a delicate girl about twenty years old — had been in the Hospital for more than a year, suffering from what was then called scrofulous disease of the knee-joint. There were extensive openings into the cavity of the articulation. The cartilages were ulcerated and partly absorbed. The bones were carious, and symptoms of hectic fever had already made their appearance.

As ether was still administered by means of a defective and clumsy instrument, it was thought desirable to operate quickly, and a "flap" amputation was performed. The knife was passed through the thigh, and the upper flap made. The patient manifested no sign of consciousness, but looked like one in a deep sleep. The second flap was then made, the bone sawed, and five arteries were tied. On the tightening of the sixth and last ligature the patient groaned, this being the first indication of sensibility. Her consciousness soon returned. She was ignorant that her limb had been removed, and for some time would not believe it possible. The amputation took one minute and three quarters, not including the time required for tying the ligatures.

"I did it rapidly," said Dr. Hayward, a year or two afterward "(though the operation has been done in less time), because I feared the insensibility might pass off, and that we had no means of continuing it as long as might be necessary."

It was generally conceded that the success of sulphuric ether could be fully and forever demonstrated only in a capital operation. The painless amputation of Alice Mohan's limb by Dr. Hayward, on November 7, is therefore justly regarded as the first decisive operation performed under its influence. However well convinced those might be who were intimately cognizant of the preceding operations, this was the actual demonstration which from its magnitude was calculated to carry to the scientific world the conviction — *first*, of the certainty of ether; *second*, of its safety; and, *third*, of the completeness of the insensibility which it produced.

Hesitation and Suspense.

Notwithstanding the complete success of this first capital operation, the use of the new anodyne was temporarily discontinued at the Hospital after October 16 and 17.

Operations were not frequent at the Massachusetts General Hospital in 1846. The Trustees, in their Annual Report of January, 1848, — practically the first Report after Morton's discovery, — related the details of the history of this supreme invention; and the subject was regarded as of such importance that the Report was republished entire in the American Journal of the Medical Sciences, and reprinted in Littell's Living Age. This Report states that "no less than one hundred and thirty-two operations, many of them of much severity, have been already performed with entire success" on etherized patients. Although this indicates that the amount of surgery which offered itself during a period of fifteen months was limited, the omission of the attending surgeons to use ether during the three weeks succeeding October 17 attracted attention. Nine operations took place between October 17 and November 7, when ether was next administered, — including a dislocation of the shoulder, the amputation of an injured thumb, the removal of an exostosis of the humerus (this patient taking a hundred drops of elixir of opium before the operation), and the laying open of extensive sinuses. Even at that early period of caution and inexperience,

some of these would seem to have been particularly appropriate cases for further trial of the new discovery.

Gilbert Abbott's etherization of October 16 was sufficiently impressive, as has been said, to elicit Dr. H. J. Bigelow's remark that he had seen "something which would go around the world;" but in spite of the suggestiveness of that operation, and still more of the operation on the following day, a speedy and immediate repetition of the use of ether did not take place. In addition to the nine operations performed at the Hospital between October 17 and November 7, six other operations — one, an amputation of the leg — occurred between November 7 and December 5, in which the use of ether was also omitted.[1] In the mean time private patients in Boston and in Salem were reaping the benefit of surgical anæsthesia.

Dr. J. C. Warren's opinion that asphyxia was the explanation of anæsthetic insensibility[2] (although subsequently he ceased to entertain that opinion),[3] together with the significance attached

[1] See Appendix.

[2] See Deposition of J. C. Warren. Answer to Cross-Interrogatory 51.

[3] Etherization, with Surgical Remarks, by J. C. Warren, M. D., p. 25.

to the dark color of the blood sometimes observed flowing from the divided arteries of etherized patients, — added to the hesitancy of experimentation. A complete failure of Morton on November 4, in an attempt to etherize a private patient of Dr. George Hayward at the North End, — an elderly woman whose breast was excised, and who inhaled ether for half an hour without effect, — did not strengthen the struggling convictions of the period. Dr. Morton attributed this failure to the fact, that, in hurriedly leaving his office to meet his appointment with Dr. Hayward, he broke the inhaler which he habitually used, and was consequently obliged to substitute another and (as it proved) altogether unsatisfactory instrument.

The secret character of the so-called *compound*, and the patent with which it was handicapped, had in reality little if anything to do with this vacillating hesitancy in its adoption; for it became generally known, after the second Hospital operation, that the agent was simply sulphuric ether. Dr. J. C. Warren testifies that Dr. Morton informed him, only a few days after the first operation, of the nature of the substance employed;[1] and Dr. H. J. Bigelow says:

[1] See Deposition of J. C. Warren. Answer to Cross-Interrogatory 16.

"Although it was never formally announced, every one knew that the article used was ether within a week after the second operation at the Hospital." Dr. Morton's authorized disclosure to the Hospital surgeons was made November 6, in a letter to Dr. J. C. Warren, which mysteriously disappeared.

This important letter, containing the first written statement of the name and nature of the new agent, and which played such a conspicuous part November 7, the day of Dr. Hayward's capital operation (see page 42), was laid upon the table in the surgeon's room at the Hospital, and thence vanished, no one knew whither, and never came to light again.[1] A letter to Dr. Warren dated November 5, 1846, has been published[2] as the letter above alluded to. It needs only to be read to make the fact apparent, that, apart from the discrepancy of date, it contains no revelation of Morton's discovery. Indeed, the testimony is conclusive that Morton's explanatory letter was lost on the spot, and within the hour; and this proves that there must have been still another letter from Morton to Dr. Warren, besides the one bearing date of

[1] See Deposition of J. C. Warren. Answers to Interrogatories 18–22.

[2] See Trials of a Public Benefactor, p. 95.

the day before that on which the explanatory letter is known to have been written.

It will thus be observed that there was a period of precarious incertitude in the introduction of ether. This crisis in its history was tided over largely by the energy of Dr. H. J. Bigelow. Had it not been for his persuasion of the senior surgeons to resume its use, after they had decided not to do so, and the incessant utterance of his conviction that an unparalleled discovery had been made, — a discovery which no personal or conventional prejudice should discountenance or obstruct, — the recognition of the anæsthetic qualities of ether would unquestionably have been delayed indefinitely; and Morton, discouraged, would at least have sought some other locality for its adoption into surgery.

Consecutive Operations.

On the day of Dr. Hayward's amputation, Dr. J. C. Warren removed a portion of the lower jaw of Betsy Magoun, — a prolonged operation, attended by embarrassing asphyxia, — during which her sufferings were greatly mitigated by ether.[1] As

[1] See Deposition of J. C. Warren. Answer to Interrogatory 14. See also "Etherization, with Surgical Remarks," by J. C. Warren, M. D., p. 24.

in the case of Alice Mohan, one hundred drops of laudanum had been given an hour or more beforehand. When the patient had recovered from the ether, she said that she was entirely insensible after a few inhalations, up to the time when the bone was being sawed; and that thereafter she suffered much until the cold compress was applied to stop the hemorrhage, which was considerable.[1]

On November 12, Dr. J. Mason Warren removed a tumor from the arm of a patient in the vicinity of Myrtle Street, Dr. Morton giving the ether.[2] On November 14, Dr. A. L. Peirson, of Salem, amputated an arm, and on the 20th a leg. On the 24th he extirpated a fatty tumor, which required an incision four inches long. In these cases Dr. Fisk, a dentist who had acquired from Morton a license to use his discovery in Essex County, administered the ether. Dr. J. M. Warren also, on November 21, removed a large

[1] See Massachusetts General Hospital Records.

On December 12, Dr. J. C. Warren removed an *upper* jaw for cancer, — his third operation with ether, — Morton administering the anæsthetic. This case has been confounded with the removal of the *lower* jaw, November 7, performed on the same day with Dr. Hayward's amputation.

[2] See Deposition of Dr. J. M. Warren. Answer to Interrogatory 6.

tumor of the thigh, at the Bromfield House, Morton giving the ether.

After December eases rapidly followed one another, and in Boston the use of ether became general. The confidence with whieh the diseovery inspired the intelligent public of this vieinity was in no way better shown than by the fact that the Hon. Edward Everett, within a month of the first experiment, made an appointment with Dr. Morton for his daughter, who, in the presence of her father, had a tooth extracted while under the influenee of ether. Dr. Jacob Bigelow, in a letter about anæsthesia written to Dr. Boot, of London, and dated November 28, incidentally says: "I took my daughter, last week, to Morton's rooms, to have a tooth extraeted," — meaning, of course, with the aid of ether.

On April 7, 1847, ether was first used in Boston in a case of natural labor, by Dr. N. C. Keep, of Boston; and for the seeond time, on May 7, 1847, in a case of instrumental labor, by Prof. Walter Channing, of the Harvard Medieal School. Etherization in labor had been already practised in January, both in Paris and Edinburgh.

Dr. Morton never gave ether to patients more than five or six times at the Hospital, although

he continued to do so to some extent for its surgeons and others in private practice.

Dr. H. J. Bigelow having made himself more familiar with the use of ether than any one else had done, and being much interested in all the details of its practical application, personally etherized most of the patients operated on at the Hospital during the year following its introduction.[1]

After its acceptance of the new discovery, the Hospital was overwhelmed with inhaling apparatuses of every device and size, — most of them cumbersome and expensive, — sent there by the makers. A contract dated January 1, 1847, between Morton and the firm of J. B. Johnson & Co., provided for the manufacture of fifteen hundred sets of apparatus; and this was but one out of four firms thus employed. It is to be regretted that these contrivances were not preserved, as they would now be interesting curiosities. The first inhaler used quickly gave way to a conical sponge, which from about March, 1847, became the only medium for giving the anæsthetic.[2]

[1] See Boston Medical and Surgical Journal, March 24, 1847.

[2] See Depositions of G. Hayward, Answers to Interrogatories 6, 15, 22, 23; and of J. M. Warren, Answers to Interrogatories 6, 8.

The sponge preserved at the Hospital is not a memento of the first etherization, but is only the first sponge there used for the inhalation of ether.

Letheon.

Long after the anæsthetic agent was known to be sulphuric ether, it was still spoken of as the "compound," the "gas," the "somnific gas," the "new discovery," the "preparation," the "mixture."

The term "letheon," commonly adopted immediately after the American patent was secured, had its origin in a meeting at the house of Dr. Gould, — Drs. H. J. Bigelow, Oliver Wendell Holmes, and W. T. G. Morton being present. Dr. Gould read aloud a prepared list of names applicable to an article familiarly known, but now put to an entirely new use. Among these was the term "letheon." Dr. Morton, on catching the word, exclaimed: "That is the name with which the discovery shall be christened." Returning to his office he said, "I have found a name for the discovery, and am going to call it Letheon." Dr. Holmes, not altogether pleased with this name, addressed the following note to Dr. Morton: —

Boston, Nov. 21, 1846.

My dear Sir, — Everybody wants to have a hand in the great discovery. All I will do is to give you a hint or two as to names, or the name, to be applied to the state produced, and to the agent.

The state should, I think, be called *anæsthesia*. This signifies insensibility, more particularly (as used by Linnæus and Cullen) to objects of touch.[1] The adjective will be *anæsthetic*. Thus we might say, the "state of anæsthesia," or the "anæsthetic state." The means employed would be properly called the "anti-æsthetic agent." Perhaps it might be allowable to say "anæsthetic agent;" but this admits of question.

The words *anti-neuric*, *aneuric*, *neuro-leptic*, *neuro-lepsia*, *neuro-stasis*, seem too anatomical; whereas the change is a physiological one. I throw these out for consideration.

I would have a name pretty soon, and consult some accomplished scholar, such as President Everett, or Dr. Bigelow, Sr., before fixing upon the terms which *will be repeated by the tongues of every civilized race of mankind*. You could mention these words which I suggest, for their consideration; but there may be others more appropriate and agreeable.

Yours respectfully,

O. W. Holmes.

[1] See Good's Nosology, p. 259.

Opposition.

Dr. Morton's dental business, especially the extraction of teeth with the aid of ether, increased so rapidly that, without assistance, he was unequal to its demands. He was obliged to enlarge his accommodations for patients, and for a time, — unsuspicious that his former partner could or would make any claim to the new invention for himself, — Morton was aided by Horace Wells, who came to Boston from Hartford to lend him a helping hand.

Notwithstanding its proved efficiency and safety, the use of ether met with determined opposition, chiefly, however, outside of New England. Many persons maintained that it was dangerous. At an early day religious scruples were urged against its adoption. Pain, it was argued, was the natural and intended consequence of the primal sin, and an attempt to do away with it must be wrong. Articles were written against ether both in professional and in unprofessional journals. In one or two instances prosecutions were threatened, not on account of the mode or the results of the administration of ether, but because it was administered at all.

While there was a certain amount of disapprobation on the part of some in the medical profession, most of it came from dentists. With a leading dentist of the day, Dr. J. F. Flagg of 31 Winter Street as chairman, the Boston dentists organized a committee to fight the discovery. The proposed patent greatly disturbed these gentlemen; and it afforded an excuse for denouncing their colleague so successfully that they frightened two estimable gentlemen — Dr. Keep and Dr. Wilson — out of partnerships they had formed with Dr. Morton. The reason of this antagonism was that a secret had been imparted to the surgeons of the Massachusetts General Hospital which was withheld from the surgeon-dentists.

In January, 1847, a New York medical journal, "The Annalist," declared: —

"The last special wonder has already arrived at the natural term of its existence, and the interest created by its first advent has in a great measure subsided. It has descended to the bottom of that great abyss which has already engulfed so many of its predecessor noveltics."

The editor of the Philadelphia "Medical Examiner" wrote: —

"We should not consider it entitled to the least notice, but that we perceive by the 'Boston Medical and Surgical Journal' that prominent members of the profession have been caught in its meshes. We are persuaded that the surgeons of Philadelphia will not be seduced from the high professional path of duty into the quagmire of quackery by this will-o'-the-wisp. We cannot close these remarks without expressing our deep mortification and regret that the eminent men who have so long adorned the profession in Boston should have consented for a moment to set so bad an example to their younger brethren as we conceive them to have done in this instance."

The first operation under ether in Philadelphia was not performed until May, 1847, when Dr. Gibson amputated the finger of a medical student under its influence. After a year had elapsed from the date of the discovery, it was still possible, in an Annual Report on Surgery, read before the College of Physicians of Philadelphia, November 2, 1847, for Dr. Isaac Parish of that city to say: —

"At the Pennsylvania Hospital in this city it has not been used at all, being considered by the judicious surgeons of that institution as a remedy of doubtful safety, or, at least, as not sufficiently established to warrant them in its employment."

Philadelphia medical schools and medical institutions at that time were in a state of great prosperity. Occupying the central position of medical prominence in the United States, they were disconcerted by the unexpected honor which had befallen Boston, — a provincial city of only about one hundred and fifteen thousand inhabitants. Consequently Philadelphia was indifferent to the discovery, and passed it lightly by as long as possible.

The doubts of the timid and the ridicule and denunciation of medical journals were unavailing, however, to prevent the efficacy and harmlessness of ether from being definitely and universally established. The opposition it encountered served only to attract a more widespread attention to its merits. As for Dr. Morton himself, — who at this time was only twenty-seven years old, — the obvious commercial value of the new agent animated his persistency and untiring activity to such a degree that he became a terror to those who were interested in the discovery. He fairly haunted Dr. Bigelow. The Hospital surgeons fled at the sight of him, and the word "ether" was sufficient to disintegrate any conversational group. "The subject of the discovery of etherization," said Dr.

Gould, "has become so offensive to us all in this vicinity, that I would gladly avoid ever alluding to it again in any shape."

Announcement of the Discovery.

An early, authoritative, and scientific announcement of the new discovery was of course imperative, and no one, by virtue of his acute and zealous observation of the whole subject, was so well qualified to unfold this intelligence to the public as Dr. H. J. Bigelow. This was done through a communication read to the American Academy of Arts and Sciences, on November 3, 1846. If we except the brief statement in the "Boston Medical and Surgical Journal," that "strange stories are told in the papers of a wonderful preparation, in this city, by administering which a patient is affected just long enough to undergo a surgical operation without pain," and the vague, incidental allusions of the newspapers therein referred to, — this was the first formal, public declaration that a safe and unfailing method of counteracting pain had been discovered. The same paper, amplified and elaborated, was read by Dr. Bigelow before the Boston Society for Medical Improvement November 9,

and was printed in the "Boston Medical and Surgical Journal" November 18, 1846.

The house of Dr. Gould, so often referred to in this narrative, had become the headquarters of those interested in the new discovery, — largely because Dr. Gould had been, as it were, the attending physician at the birth of ether, and the first to see any operations performed under its influence at Morton's office; but more particularly because Dr. Gould's well-known probity, his professional and scientific position, and his recognition of the magnitude of the event made him the natural nucleus of such a company. He was also on most friendly terms with both Dr. Morton and Dr. Jackson. Here, therefore, on Sunday evening, November 15, Dr. Gould, Dr. Bigelow, Dr. Morton, and R. H. Eddy, Esq., and, finally, Dr. C. T. Jackson, met in council. Dr. Bigelow's paper was to be published in the next issue of the "Boston Medical and Surgical Journal," and he desired first to submit it to Drs. Morton and Jackson. The copy must be at the printer's on Monday morning. Dr. Jackson was not to be found during the day, but Dr. Bigelow saw and left with Mrs. Jackson a message, requesting him to come to Dr. Gould's in the evening. Previous to Dr. Jackson's arrival,

the paper was read and talked over. When he finally appeared at the meeting, and learned the object of Dr. Bigelow's paper, Dr. Jackson remonstrated with much agitation against its publication; but upon being induced to look through the article, and finding that it contained nothing which touched upon the question of discovery, he calmed down, and offered no further opposition, except to an allusion to his alleged discovery of the magneto-electric telegraph, prior to Morse. This being willingly stricken out, the paper was sent to the "Medical Journal" office, and appeared in the succeeding number.[1]

[1] Dr. Jackson asserted himself to be not only the discoverer of practical anæsthesia, but of gun-cotton and the electric telegraph. In October, 1832, he was a fellow-passenger with Prof. Samuel F. Morse and others, on board the ship "Sully," from Havre to New York. One day at table, after dinner, the company, and among them Professor Morse, were conversing on the then recent scientific discoveries in electro-magnetism; and the question was asked if the length of wire in the coil of the magnet did not retard the passage of the electricity. In proof that it did not, Dr. Jackson alluded to Franklin's experiments, in which he caused electricity to make a journey of twenty miles, by means of a wire stretched up the Schuylkill River, the water constituting a portion of the circuit, without any appreciable loss of time. The possibility of making electricity the means of communicating intelligence then flashed across Professor Morse's mind, and he observed that he thought it would not be difficult to construct a system of signs

Dr. Bigelow's paper, even when read at the present time, is certainly striking. If an account of practical anæsthesia were written to-day, it could hardly be more definite, or show a clearer comprehension of the subject, than does this communication, the gist of which was read to the Academy a few days only after the first operation under ether which the writer (or any one else) had ever witnessed.

Of this communication, five years after it was published, Dr. Jackson wrote as follows: —

"The few medical gentlemen, or young surgeons, who have not recognized my rights in this discovery are, I lament to say it, anxious to obtain a larger share of the glory than rightfully belongs to them. Dr. H. J. Bigelow very distinctly claims the honor of being the first to promulgate this great discovery, he having stealthily published my discovery before I was

by which messages might thus be sent. This was his first thought of the telegraph, and the system now in operation was elaborated before the close of the voyage. According to Dr. Jackson, the idea of a magneto-electric telegraph was derived from him in the conversation above alluded to, and appropriated by Professor Morse, — who, on his part, maintained that no hint whatsoever from Dr. Jackson was used in the invention. A fierce controversy resulted. (See Morse's Patent. Full Exposure of Dr. Charles T. Jackson's Pretensions to the Invention of the American Electro-Magnetic Telegraph, by Hon. Amos Kendall, late Postmaster-General. Washington, 1852.)

ready to lay it before the public, and while I was temporarily absent from the city, by reading an account of it before two societies of which I was and am now a member, — the Boston Society for Medical Improvement, and the American Academy of Arts and Sciences, — and afterward published his paper in the 'Boston Medical and Surgical Journal,' against my solemn protest and denunciation of it as false, unjust, and quackish. In that paper the nature of the agent used is concealed, and hence it is a mere quack advertisement.

The Discovery made known in Europe.

The next steamer of the Cunard Line (which had been but a few years established, and was then the only line of Anglo-American steamers) sailing from Boston, carried a letter from Dr. Bigelow, dated November 28, to Dr. Francis Boot, of Gower Street, London, announcing the discovery of anæsthesia by ether. Dr. Boot, a cultivated and well-known physician, was affiliated with many Boston families, and a personal friend of Dr. Bigelow. On December 17, Dr. Boot communicated his information to Mr. Robinson, a dentist who lived near him; and this gentleman, on the 19th, at Dr. Boot's house, and in the presence of some members of the

family, painlessly extracted a molar tooth for Miss Lonsdale, a relative of Dr. Boot. In three or four later cases, in which etherization was attempted, the apparatus used on this first occasion failed to produce insensibility through some defect in its valves. Neverthcless, the discovery rapidly made its way in London hospitals, and was hailed with rapturous enthusiasm. On December 21 Liston amputated a thigh, with perfectly satisfactory results, and performed evulsion of the great toe-nail, "without the patient being aware of what was going on, so far as regards pain."

Although it was not until an inhaler arrived from America that the early experiments in London were wholly succcssful, the discovery was acknowledged by London surgeons to be a glorious conquest for humanity. The grave and sedate Liston could not control his language, but in a letter freshly written on the English verification of the discovery, burst forth: "Hurrah! Rejoice! An American dentist has used ether — inhalation of it — to destroy sensations in his operations, and the plan has succeeded in the hands of Hayward, Warren, and others in Boston. In six months no operation will be performed without this previous preparation. Re-

joice!" The general interest in the discovery was so great that in Edinburgh it was thought worthy of being recorded that the "singularly humane Chalmers" witnessed a bloody and severe operation "with composure and serenity."

The news quickly reached the continent of Europe. Although at first looked upon there with incredulity, the "great American discovery," as it was called, finally took firm hold of the scientific world with wonderful power and unanimity.

In November, Dr. Francis Willis Fisher, of Boston, then studying in Paris, received a letter from his former medical instructor, detailing the new use of ether. He immediately communicated this information to M. Velpeau, but failed to persuade that great surgeon to use the new invention. Dr. Fisher therefore tried it on himself, using a rude apparatus constructed for the occasion, with the purpose of having a tooth extracted; but the experiment proved a failure. On December 15 Fisher gave ether at the Saint Louis Hospital, at the request of M. Jobert de Lamballe, to a man about to be operated on for cancer of the lip. In consequence of the tenderness and condition of the parts, the patient experienced a difficulty in applying his mouth to

the glass globe from which the vapor was inhaled, and did not become sufficiently affected to be insensible to pain, or to satisfy M. Jobert of the efficiency of the new application.

Nothing more was attempted in the way of experiment with ether until the accounts of American and English surgeons were published in the medical journals of Paris. On January 12, M. Malgaigne reported to the Academy of Medicine the results of four operations performed at the Saint Louis Hospital on patients under the influence of ether. The report gave rise to an animated discussion.

On January 23, at the invitation of M. Roux, Dr. Fisher administered ether at the Hotel Dieu Hospital with perfect success, by means of a "Boston Inhaler," which had just been sent him by a friend. On the same day M. Velpeau operated on a patient at La Charité Hospital with a like fortunate result.

The Patent.

On the first of October, 1846, Morton applied to R. H. Eddy, Esq., a much respected patent-solicitor of Boston, to aid him in procuring a patent. Mr. Eddy advised Morton that if Dr.

Jackson were not joined with him in the patent, the fact of his having given the information of September 30 would be used to impeach its validity; but that if Dr. Jackson were joined as co-patentee, his name and his advice could be made useful in bringing out the discovery, and in giving it prestige.

In a conference with Dr. Jackson, Mr. Eddy was informed by that gentleman that by the laws of the Massachusetts Medical Society he would be expelled from membership if he took part in the patent of a secret remedy. He stated that his intention was to make a professional charge against Morton of five hundred dollars for advice; and he added that Morton might take out a patent if he so desired, and do with it what he pleased. At a subsequent interview Mr. Eddy urged Dr. Jackson to waive his objections, which he finally did, being influenced thereto by a consultation with Dr. Gould, who argued that the term "secret remedies" did not apply to patented articles, the nature of which, being made matter of public record at the Patent Office, was therefore never secret.

Dr. Morton, from its first suggestion by Mr. Eddy, was opposed to the admission of Dr. Jackson to any partnership in the patent; but when

Dr. Gould also advised it, on the ground of Dr. Jackson's attainments, Morton (who had a profound respect for Gould's opinion) yielded his objection, — allowing his own judgment to be overruled by the arguments of men wiser, as he thought, than himself. The names both of Jackson and Morton were therefore joined in the application for a patent.[1]

The papers for the American patent were executed October 27. Dr. Jackson thereupon made an assignment to Dr. Morton of all right and interest whatsoever which he possessed in the invention or discovery, Morton in return giving a bond to pay him ten per cent of the proceeds on all sales of licenses. Later on Dr. Jackson demanded twenty per cent, and subsequently twenty-five per cent, as the least which could justly be offered him; but both of these demands Morton refused to allow.

[1] I consider all your troubles and present difficulties to have arisen from the mistaken advice of Mr. Eddy, to let in Dr. Jackson as a joint discoverer. His advice was given from a desire to benefit Dr. Jackson, in ignorance of the true facts, and from a greater desire to benefit himself and make the patent safe, whoever was the discoverer; and was accepted on your part — under protest to be sure — from too great a desire to make a fortune out of your patent — *Letter of R. H. Dana, Jr. to Dr. Morton, January* 3, 1853.

The patent, No. 4848, was issued November 12, 1846, for fourteen years. Dr. Jackson's assignment was recorded at the Patent Office two days previously.

The subsequent history of the bond given to Dr. Jackson is noteworthy. On May 26, 1847, five months after the patent was obtained, Dr. Martin Gay — a brother chemist, and the reputed author of a pamphlet entitled, "A Statement of the Claims of Charles T. Jackson, M. D., to the Discovery of the Applicability of Sulphuric Ether to the Prevention of Pain in Surgical Operations" — called at Dr. Morton's office, and asking for pen and ink, somewhat dramatically erased the names from the bond, giving Dr. Morton no opportunity either to approve or disapprove the transaction. On the same day, at the anniversary dinner of the Massachusetts Medical Society, Dr. Jackson made a speech, in which he declared that he had destroyed the bond which gave him claim to any pecuniary interest in the new discovery. He did not say, however, that this was done that very morning, barely in season to make his statement truthful.

Dr. Morton gave free use of the discovery to the Massachusetts General Hospital, and requested from Dr. J. C. Warren a list of all similar insti-

tutions in the country, that he might extend its benefits to them. His formal donation to the Hospital was made in the following terms: —

19 Tremont Street, Boston, Dec. 14, 1846.

To the President and Trustees of the Massachusetts General Hospital:

Gentlemen, — Most, if not all of you, may be aware that I have, both privately and publicly, declared that it is not my intention or desire to receive from benevolent infirmaries, nor from persons in destitute circumstances, any compensation for the employment of the new discovery whereby pain may be prevented, or alleviated, in surgical operations. Long convinced of the excellence of the charitable establishment over which you preside, and of its great and increasing importance in the service of humanity, I beg leave respectfully to inform you that I shall be happy to present to the Massachusetts General Hospital, if it be agreeable for the President and Trustees to accept the same, the fullest right, under the letters patent granted to me by the Government of the United States, to use the discovery above mentioned for the benefit of indigent patients, the sick and suffering poor, and other persons at the institution.

With great respect, I am, gentlemen,

Your most obedient servant,

W. T. G. Morton.

On November 26, 1846, Morton issued a circular, setting forth that he was prepared to dispose of licenses to use his discovery and apparatus in any part of the country, agreeing, in a distinct clause of the license, to repay the fee, should the Government of the United States adopt the invention, — as might be the case if the public good so required. Dr. H. J. Bigelow, who suggested this clause, very early urged upon Morton the inexpediency of a patent, on the ground that, like Whitney's cotton-gin, the invention of anæsthesia by ether was so valuable that the world would take possession of it, and that compensation for the discovery might safely be left to public generosity, which had usually recognized such debts.

This conviction found expression in a Memorial to Congress, dated November 20, 1847, signed by all the surgeons, and by all but one or two of the physicians of the Massachusetts General Hospital, praying that "such sums as shall be thought adequate may be paid by the Government of the United States to those persons who shall be found, on investigation, to merit compensation for the benefit conferred on the public by this discovery, and on condition of the relinquishment by them of any patent right they may

hold restricting its use." This Memorial was promoted to the utmost of his power by Dr. Morton, who courted an official inquiry into the discovery. Dr. Jackson, on the other hand, remonstrated against it, on the professed ground that he would submit his claims to no tribunal; and that, as the sole discoverer, he wished no reward but the gratitude of mankind.

Dr. Morton's terms for dentists, as announced in the above-mentioned circular, ranged from fifty dollars for five years, in cities of from five to ten thousand inhabitants, up to two hundred dollars for five years, in cities of one hundred and fifty thousand inhabitants. Surgeons' licenses were to be made on a basis of twenty-five per cent of all charges for performing operations wherein the discovery was used, — fifteen dollars to be paid down, — and included the apparatus and a bottle of the "preparation." The parties licensed were to keep correct accounts of all operations, the names of the persons operated upon, — the same to be forwarded to Dr. Morton, — and to settle their indebtedness as often as once in three months.

The Controversy.

It is singular, when all the events pertaining to the discovery of ether anæsthesia occurred in a narrow circle of high-principled and educated men, that a dispute should have arisen within so brief a time, creating a doubt, never cleared up in the minds of some, as to how the discovery originated.

The erroneous opinion generally prevailed that Dr. Morton's claim was for the discovery of the anæsthetic properties of sulphuric ether, — a discovery, the remote and uncertain origin of which has never been determined. That insensibility could be produced by inhaling sulphuric ether had long been well known. What remained to be proved was —

1. The degree to which this insensibility could be carried.
2. The safety with which this could be done.
3. The uses to which this state could be put.

These facts could be demonstrated only by actual experiment. No extraordinary degree of scientific attainment was necessary for their determination. Their discovery could be made by any courageous and persevering man.

Opinions differed in regard to the definition of "a discovery," and there was no competent tribunal to establish a decision on the points at issue; yet the simple gist of the discovery was this, — that the inhalation of sulphuric ether would produce *such a degree* of insensibility that the most severe surgical operation might be performed without pain. That which constituted the miracle of the discovery, before which the whole scientific world bowed down as to a new law in Nature, was the extent and completeness of this insensibility, and the safety with which it was produced.

When the question ultimately came before Congress, — to which, after the patent proved worthless, appeal was made for a reward to the discoverer, — it was found, as might have been expected, that this body was ill fitted to estimate the weight and quality of scientific evidence, not to say of the evidence of facts. When history was obscured by time, — when other States besides Massachusetts, and even another nation, put forward new claimants, — then testimony, heretofore distinct, became vague and ambiguous; and each alleged inventor, with his partisans, aimed to secure the whole credit of the discovery. The difficulty was enhanced by the

magnitude of the reward due, both in honor and in emolument.

Dr. Jackson's Claim.

The parties to this repugnant controversy, which persisted until it wore itself out, were practically but three, — Dr. Jackson, Dr. Morton, and Horace Wells.

The most aggressive participator, Dr. Charles Thomas Jackson, had never been familiar with surgery.[1] He was a gentleman of scientific attainments, especially in chemistry, mineralogy, and geology, being known at that day as an expert in those departments. He declared that he told Morton to use ether by inhalation, when the latter came to Jackson's laboratory for the loan of a gas-bag, on September 30, 1846; and he based the claim to special knowledge of the anæsthetic properties of ether on the following alleged circumstance.

In the winter of 1841–42, he accidentally broke a large jar of chlorine gas, which he had prepared for a public lecture. In his efforts, he says, to

[1] Dr. Jackson was born at Plymouth, Mass., June 21, 1805. He graduated from the Medical School of Harvard University in 1829. His death took place at Somerville, Mass., in 1880.

save the vessel he breathed into his lungs so much chlorine gas that he was "nearly suffocated," and his "life was in imminent danger." He immediately had ether and ammonia brought to him, and inhaled both remedies alternately, with such great relief that he delivered his lecture "without much difficulty."

The next morning, being still uncomfortable, he determined to make a thorough trial of the inhalation of ether; and for this purpose he went into his laboratory, and performed the act from which he claims to have deduced the discovery of surgical anæsthesia. He says that he had a large supply of perfectly pure, washed, sulphuric ether, which had been prepared in the laboratory of his friend John H. Blake, of Boston, and with this he etherized himself from a folded towel, remaining unconscious not less than a quarter of an hour.

It is also in evidence that in March, 1846, Dr. Jackson recommended, and Dr. W. F. Channing inhaled, sulphuric ether as an antidote to chlorine gas, which Channing had accidentally inhaled in Dr. Jackson's laboratory.

Having had this experience, Jackson insisted that Morton, when told to make his refractory patient inhale ether, assumed only the responsi-

bility of an agent or operator, or of the nurse who administers the new and bold prescription of a physician, — a prescription, it may be added, which in this case Dr. Jackson gave orally, and refused subsequently to put in writing. Dr. Morton, it may also be observed, differed from an agent, operator, or nurse, in this, — that after receiving the prescription, he voluntarily went and sought out a patient who was willing to submit to its administration.

It may be said also that Dr. Jackson's accident with chlorine, which did not prevent his lecturing, was unknown to at least one of the principal residents in his household. The now distinguished Prof. Josiah D. Whitney, then boarding in Dr. Jackson's family, testifies that he never knew or heard of the accident, as — he continues — "I have no doubt I should if it had been a serious one, or attended with such peculiar circumstances as those mentioned by Dr. Jackson in his statement."

The question naturally arises as to the right to claim as a discovery a mere induction which has never been verified by experiment, — an induction, moreover, highly improbable in itself, and not depending upon fixed laws, like those of physics or mathematics, but upon physiological

phenomena; since no one, when etherized, can test on himself the degree of insensibility which surgeons require in their operations.

Mr. Peabody, of Salem, — a pupil of Dr. Jackson, — states that in February or March, 1846, Dr. Jackson recommended him to inhale ether on one occasion when he was about to have two teeth pulled, — an experiment which Mr. Peabody's father, an excellent amateur chemist, would not permit the young man to carry out, because, as he says, he "feared irritation of the lungs might ensue, the best authorities on the subject being arrayed against Dr. Jackson, and because he was unwilling to incur any risk for so slight an operation." Dr. Jackson is also alleged to have told Mr. Henry D. Fowle, Dr. S. A. Bemis, Dr. W. F. Channing, and others, as far back as 1842, or even in 1841, of the anæsthetic efficiency and safety of an agent vaguely alluded to as "something," "not chloric ether," "ether," or "sulphuric ether;" but his information was not repeated or supported in such a manner as to produce any result. Indeed, there are those who believe that in this reference to an anæsthetic *something*, he only had in mind the carefully prepared chloric ether which in 1844 he

commended to Morton and others as of utility in dentistry.[1]

The strength of Dr. Jackson's conviction as to the efficacy of ether, when he was conversing about it with these gentlemen, — recommending it to Peabody, proposing its use to Morton, or assuring another of his pupils, Mr. Barnes, of Morton's success "if he followed his directions," — cannot have been great; for with this transcendent knowledge in his possession, he did not suggest the use of ether when two of the nearest members of his own family had teeth extracted by Dr. Morton in 1844. They strongly objected to the pain, and begged to be mesmerized; but they were encouraged by Dr. Jackson to submit, who being present did not offer the slightest hint toward securing the much-desired immunity, — though this was subsequent to the two instances in which, according to his own account, Jackson had himself inhaled ether, and on which he chiefly based his claim to the discovery of its anæsthetic qualities.

When the subject of ether was first agitated before the French Academy, a person present rose and declared himself to have made the dis-

[1] See pages 21–23.

covery several years before; whereupon M. Velpeau exclaimed: "Sir, you did not make the discovery! Else why have you suffered thousands of the human race to undergo the tortures of surgery during these years if it was in your power, by a word, to have relieved them?" [1]

Dr. Jackson assumed no responsibility in the first experiments with ether, and still less in those immediately following. No memorandum existed, in case of his sudden death, to connect his name with the discovery, or to secure the discovery itself to the world. He went off to a mine in the town of Liberty, Maryland, soon after he heard of the operation of October 16, and did not return until the middle of November. He took no part in its introduction into surgical practice, but even declined an invitation from Dr. J. C. Warren to be present and himself administer ether in the first capital operation performed at the Hospital.[2] The greatest discovery of the age was under trial in the next street, as it were, to his laboratory. He was an

[1] Boston Medical and Surgical Journal, June 30, 1847.

[2] See Deposition of A. A. Gould. Answer to Interrogatory 20. See also "Statements Supported by Evidence," etc., p. 102.

experimenter by occupation, and a physician by education. Ambition, curiosity, — everything, — would naturally urge him to be present; but he kept himself entirely aloof, and actually did not visit the Hospital for more than two months after ether was regularly in use at that institution.

It was not until October 27 (ten days after the first two Hospital operations with ether), at a meeting of the Warren Club, now known as the Thursday Evening Club, that either Dr. J. C. Warren, at whose house the club met,[1] or Dr. George Hayward, had any intimation that Dr. Jackson was in any way connected with the discovery of surgical anæsthesia. Instead of going at once to Morton's office, as Dr. Gould and Dr. Bigelow did, to acquire an experience which he, no less than they, did not possess, he went there, for the first and only time after the discovery was announced, on October 23, — a week after the second Hospital operation; and then his visit was for the sole purpose of speaking to Morton about the patent, which he had heard was intended to be taken out, and to tell him that he proposed to make a

[1] See letter of J. C. Warren to Hon. Edward Stanly, March 30, 1852. See also Deposition of J. C. Warren. Answers to Interrogatories 42, 44, and 51, and Cross-Interrogatory 19.

professional charge of five hundred dollars for the advice he had given on September 30. Dr. Jackson witnessed an operation under ether for the first time at the Bromfield House, November 21, Dr. J. M. Warren being the operator, and Morton administering the ether; and he first saw its similar administration at the Hospital on January 2, 1847, at an amputation of the leg of Fanny Abbot, performed by Dr. S. D. Townsend. Dr. Jackson ridiculed Morton's enthusiasm, and even joked him about the charge of five hundred dollars for advice, until it dawned upon his mind that a discovery had been made; and then he began to express the greatest anxiety lest injurious effects or loss of life should result from Dr. Morton's incompetency and ignorance, — forgetting, apparently, that he had himself advised Morton to use ether in the case of a certain supposititious patient, and afterward deliberately claimed that Morton acted as his agent in this application of the new discovery. Dr. Jackson, moreover, told Mr. Burnett, the apothecary, that Morton would "probably kill some one with ether before he had done with it," and yet he made no effort to warn the Hospital surgeons (either personally or as a body, albeit they were his neighbors and friends) of

the recklessness and temerity which he attributed to Morton.

"On the evening of Friday, October 23, 1846," says Caleb Eddy, Esq., in an affidavit, "Dr. Charles T. Jackson visited my house. During the evening I requested him to relate to me the particulars of the new discovery for prevention of pain in surgical operations." After Jackson had related the story of Dr. Morton's visit of September 30, Mr. Eddy said to him: "Dr. Jackson, did you know at that time that after a person had inhaled ether, and was asleep, his flesh could be cut with a knife without his experiencing any pain?" Jackson replied: "No, nor Morton either. He is a reckless man for using it as he has. The chance is he will kill somebody yet."

When Jackson came to the Hospital operation on January 2, 1847, he brought with him a bag of oxygen gas, and said to Dr. Townsend that the surgeons should never be without it, prepared and ready, in case of accident in the employment of ether; for he erroneously supposed that asphyxia (always preventable, on account of its admonitory and visible cyanosis), instead of over-inebriation (with its indications in the pulse, and upon which, it has been proved, oxy-

gen gas exerts no salutary influence), was the danger to be guarded against in etherization. This was the first act which indicated to the Massachusetts General Hospital that Jackson had any interest in the subject then occupying the mind of the general public. Dr. Jackson even confounded Drs. Warren and Hayward in their relation to the first capital operation under ether,[1] and did not know until after March 1, 1847, who it was that had "politely consented" to do this important act four months before. His words are: "Desirous of testing the ether in a capital operation, Dr. Warren politely consented to have the trial made." In plain terms, Dr. Jackson claims that Dr. Hayward's amputation was performed at his request, made through Dr. Warren.[2]

Six years after the introduction of ether into use, — namely, December 16, 1852, — Dr. J. C. Warren testified that Dr. Jackson, so far as Warren knew, had never taken part or share in the administration of ether in a single case.[3]

Dr. Jackson's first written claim to the dis-

[1] See Deposition of G. Hayward. Answer to Cross-Interrogatory 4.

[2] Boston Daily Advertiser, March 1, 1847.

[3] See Deposition of J. C. Warren. Answer to Interrogatory 34.

covery of surgical anæsthesia was made in a letter dated November 13, 1846, intended to be communicated to the French Academy of Sciences, and addressed to his friend, L. Élie de Beaumont, of Paris, an eminent geologist, in which Jackson sets forth the alleged manner in which he had arrived at his discovery, and the measures he intended to take for giving it publicity. On December 1, a little more than a fortnight after the date of this letter, Dr. Jackson wrote a second to M. de Beaumont.

These two letters, enclosed in one envelope, and forwarded by the same mail, reached Paris December 20. They were deposited by De Beaumont with the secretary of the French Academy of Sciences on December 28, and were opened and read at the meeting of the Academy on January 18, 1847.

After the reading, M. Velpeau remarked: "The secret contained in the note which has just been read is no longer a secret. The medical journals published in America and England divulged it in the months of November and December. A letter from Dr. Warren, of Boston, communicated the information to me more than one month ago; and Dr. Willis Fisher, of the same city, proposed that I should try its effects

at La Charité Hospital towards the middle of last December." [1]

At a social meeting of the American Academy of Arts and Sciences, held in Boston, March 2, 1847, at the house of Mr. Nathan Appleton, Dr. Jackson first publicly and decisively proclaimed (in this country) that the discovery was made by himself. The short paper read on that occasion was printed in the "Boston Daily Advertiser" of the day before. This was in order to send copies abroad in the mail steamer of March 1. That article was universally looked upon in Europe as giving the approval of the Academy to Dr. Jackson's claims; and though, as a matter of fact, no Academic sanction could be conveyed in advance by an individual member, the European tide of opinion in Dr. Jackson's favor which the paper created was never counterbalanced. Dr. Morton's name was not mentioned in it, as it had not been in the letter to Élie de Beaumont. All the experiments at the Hospital and elsewhere were declared to have been made at the request and under the direction of Dr. Jackson.

The publication of Jackson's paper before its presentation to the Academy was severely cen-

[1] See page 69.

sured. The Vice-President of the Academy (acting as President at that time), the Hon. Edward Everett, in a letter to Dr. Morton, disavowed, in behalf of that body, all responsibility for Jackson's action. Indeed, no little indignation was felt on this occasion, and the sympathies of many who had previously endeavored to favor Dr. Jackson were decidedly alienated from his cause.

It was not, however, until May 20, 1847, that, among the innumerable papers written in relation to the subject, there appeared anything which represented, in the form of a detailed account, Dr. Jackson's attitude in regard to the discovery; and even then it was written in the name of Dr. Martin Gay, a chemist, who had been for many years a warm personal friend of Jackson. In this pamphlet, whose full title has already been given,[1] Dr. Gay states that "the history of the discovery has been derived from Dr. Jackson himself."

As bearing on the history of this pamphlet, it may be well to state that a public meeting held in Steinway Hall, New York, in May, 1873, having had the effect of reviving the "Ether controversy" in the newspapers of that city,

[1] See page 72.

the "New York Evening Post" of May 26, 29, and June 30, printed three editorials, which were so strongly in favor of Dr. Morton, and showed such acquaintance with the facts pertaining to a proper discussion of the subject, that a friend of Morton was interested to ascertain who had written so warmly in his behalf. The acting editor of the "Post," Mr. Sidney Gay, avowed himself the author of the several articles. When asked how he had obtained his accurate and familiar knowledge, he replied, with a little hesitation, that he had written the pamphlet for his brother, Dr. Martin Gay, entitled, "A Statement of the Claims of Charles T. Jackson, M. D.," etc. At this interview Mr. Gay declared that when he wrote this pamphlet he was not a believer in the correctness of its "claims," and that he had been glad of the opportunity to make some reparation by writing the editorials in question.

Although Dr. Jackson's course deprived him of a large share of the credit considered by many as belonging to him, he is still believed by others to have contributed essentially to the discovery of successful surgical anæsthesia; and these defenders base their conclusion on the following points, all of which they assume to find proved

by the evidence in regard to the memorable meeting between Dr. Morton and Dr. Jackson on September 30, 1846: —

1. That Dr. Jackson proposed to Dr. Morton the use of sulphuric ether by inhalation.

2. That Dr. Jackson directed Dr. Morton to use rectified sulphuric ether.

3. That Dr. Jackson gave Dr. Morton directions in regard to the manner of administering sulphuric ether.

4. That Dr. Jackson gave Dr. Morton assurances of the safety of sulphuric ether.

Dr. Morton's Claim.

Dr. Morton, on the other hand, was in eager pursuit of anæsthesia for many months previous to his famous interview, or interviews, with Dr. Jackson on the subject. Although an unlearned man, he maintained not only that he had long been familiar with ether, but that Dr. Jackson's asserted special knowledge was simply a knowledge which all physicians possessed, and therefore was not comparable with the experimental and practical knowledge which he, Morton, had acquired for himself.

Pareira's "Elements of Materia Medica," for example, was published in 1839, three years before Dr. Jackson's chlorine accident, and it is in evidence that Morton purchased this book on May 3, 1845. On pages 210–11, this author says, —

"The vapor of ether is inhaled in spasmodic asthma, chronic catarrh, dyspnœa, and whooping cough, and to relieve the effects caused by the accidental inhalation of chlorine gas.

"When the vapor of ether, sufficiently diluted with atmospheric air, is inhaled, it causes irritation about the epiglottis, a sensation of fulness in the head, and a succession of effects analogous to those caused by protoxide of nitrogen, — nitrous oxide gas; and persons peculiarly susceptible to the action of the one are also powerfully affected by the other. If the air is too strongly impregnated with ether, stupefaction ensues."

Then, again, to show how well Pareira's statement was known, in February, 1848, James T. Hodge, well known as a geologist and chemist, wrote to R. H. Dana, Jr., that in 1844 he inhaled sulphuric ether as an antidote to chlorine gas, a strong draught of which he had accidentally drawn into his lungs, and by which he was

rendered speechless for several hours ; and that he did this on the advice of Professor Ellett, of the chemical department in the College at Columbia, S. C., who regarded it simply as the established prescription.

It should be here stated, however, that Dr. Jackson claimed never to have read Pareira ; and that his (Jackson's) discovery of ether as an antidote to chlorine gas was therefore independent and original.

In contesting his position, Morton declared: "I am ready to acknowledge my indebtedness to men and to books for all my information on this subject. I have got here a little and there a little. I learned from Dr. Jackson, in 1844, the effect of ether directly applied to a sensitive tooth, and proved by experiment that it would gradually render the nerve insensible. I learned from Dr. Jackson, also in 1844, the effect of ether when inhaled by students at college, which was corroborated by Spear's account, and by what I read. I knew of Dr. Wells's attempt to apply nitrous-oxide gas for destroying pain under surgical operations. I had great motive to destroy or alleviate pain under my operations, and endeavored to produce such a result by means of inhaling ether ; inferring that if it would

render a nerve insensible when directly applied, it might, when inhaled, destroy, or greatly alleviate, sensibility to pain generally. Had the ether I tried on August 5 been pure, I should have made the demonstration then. I further acknowledge that I was subsequently indebted to Dr. Jackson for valuable information as to the kinds and preparations of ether, and for the recommendation of the highly rectified article from Burnett's, as the most safe and efficient. But my obligation to him 'hath this extent, no more.'"

Although Dr. Jackson suggested the use of sulphuric ether to Dr. Morton, the proposal was drawn out of Jackson by Morton while the latter was in actual pursuit of something to destroy pain in a case alleged to be literally waiting in his office. Dr. Morton's right to the discovery rests, however, on what he did after he left Jackson's laboratory. The evidence cannot be disparaged that Morton made the first practical application of the anæsthetic properties of sulphuric ether; that he was the first to demonstrate the great fact that the human system is capable of being safely placed in a condition in which it becomes insensible to pain, and that it can be kept in this condition throughout severe surgical operations without injury. The experi-

ments Morton had performed previously, and the fact that he sent into the streets to cajole or hire a man to breathe ether, have little to do with his successful establishment of surgical anæsthesia. Dr. Gould said: "I would not give the snap of my finger for Dr. Morton's alleged previous experiments, except so far as they go to show his having been previously considering the subject."

The conclusive controversial fact is, that the demonstration of surgical anæsthesia was not conducted by Dr. Jackson, but by Dr. Morton. Dr. Jackson's suggestion was put to the test by Dr. Morton; and after its demonstrated success in the person of Mr. Frost, Morton alone, with the surgeons of the Hospital, assumed all the risks of the subsequent experiments. He was the only person present at the first two operations who knew what the substance was which he administered to the patients, and the sole administration of ether was in his hands for many weeks, until it was fully admitted into surgical practice.

In describing the incidents connected with Dr. Dix's early operation under ether,[1] Dr. H. J. Bigelow forcibly remarks: "To Morton's

[1] See page 41.

impetuous, unremitting, reckless experimentation to establish anæsthesia, surgeon, bystander, patient, ether, and apparatus were all for the time subordinate. Morton had asked me to be present, because I was more familiar with the new process than any one except himself, and for the purpose of aiding him in emergency with professional advice; but the anæsthesia was his. I assumed no responsibility. Had the patient died in a stupor, as he might well have done, Morton was liable; and as the patient did not die, his was the credit."

The following interesting letter, written by Prof. Louis Agassiz to the Hon. George T. Davis, United States Representative at Washington when one of the Congressional Committees was investigating Morton's claim, becomes a significant document in this connection. The original letter is in the possession of the Massachusetts Historical Society, by whose permission it is here introduced.

CHARLESTON, S. C., March 10, 1852.

DEAR SIR, —I do not think that I ever asked a question of Dr. Jackson in reference to etherization *in* a meeting of the American Academy; but I remember distinctly that *after* such a meeting, — walk-

ing home with him and several other gentlemen, among whom I remember Dr. A. A. Gould, of Boston, and discussing the extent of Dr. Jackson's claim in this matter, — I asked Dr. Jackson whether, in case Dr. Morton had killed the first patient to whom he applied ether at Jackson's suggestion, he, Jackson, would have claimed the whole merit for the discovery, or even the credit of the suggestion? To which he answered nothing. This conversation took place soon after my arrival in this country, in the fall of 1846; but I cannot remember the precise date. It was, however, at the time when the first successful surgical operations were being performed under the influence of ether, by Drs. J. C. Warren and G. Hayward, — circumstances which may settle the date within a few days, by looking up the records of these performances.

My absence from Cambridge will explain the delay of this answer to your inquiry, which I beg you to excuse. With high regard,

Yours very truly,

L. Agassiz.

Hon. George T. Davis, Washington.

Mrs. Morton, during the period of the early operations with ether was, it will be remembered, a member of Dr. Gould's family. His kindness and sympathy encouraged her; but she says: "The personal experiences of those days and

months have never yet been written, — so full of anxieties and, to me, of absolute terror, waiting for the disaster which everybody assured me would come."

Horace Wells, who came to Boston to aid Dr. Morton when in the autumn of 1846 he was overwhelmed with the rush of business at his office, stayed there only three or four days, and then returned to Hartford because, as he said, he became so convinced that somebody would be killed by the ether.

It has been truly said, therefore, of Dr. Morton, that, " like the pioneers who have penetrated the Arctic regions and the deserts of Africa, he had a hardihood and a tenacity of purpose which coerced him, where more cautious and perhaps better instructed men had failed to advance. As far as we know, he is the only man without whom anæsthetic inhalation might have remained unknown to the present day."

Horace Wells's Claim.

This narrative left Horace Wells in January, 1845, discouraged and disappointed by the failure of his Boston attempt to exhibit the anæsthetic properties of nitrous-oxide gas. Not more

than one or two instances of his employment of this gas in tooth-pulling, after his return home, are proved, and those doubtfully. Except in the case of his Boston visit, he never made any effort to extend its use beyond the circle of his friends in Hartford.

No private memorandum, friendly note, or formal publication in regard to nitrous-oxide, or his relation to any further attempts in making dentistry painless, can be traced to Wells until December 7, 1846, when he announced himself as the discoverer of successful anæsthesia, in a letter to the "Hartford Courant" of that date, nearly two months after a safe, certain, and efficient anæsthetic had been made known by another person, and received by surgeons and the public throughout the world.

Wells abandoned dentistry immediately after his Boston reverse, and had engaged in various small commercial enterprises. At the close of the year 1846 he went to Paris, with the intention of buying cheap copies of pictures in the Louvre and elsewhere, which he hoped to bring home and sell by auction at a large profit. He remained abroad until March, 1847.

Hearing while in Paris that Dr. Jackson was being accepted as the author of the new dis-

covery, Wells wrote a letter to "Galignani's Messenger," dated February 17, 1847, setting forth his own claims. This letter was reprinted in the "Boston Atlas," April 2, 1847. Wells also sought the advice of Dr. Brewster, an American dentist then filling a conspicuous position in Paris. When he told his story, asserting his own right to the original idea of painless surgery, Brewster advised him to return home immediately and prepare and publish his evidence, — which he had not brought with him to Europe, as his visit there had no connection with the subject, — and thus establish his claim to have been the discoverer of surgical anæsthesia prior to either Jackson or Morton.

On his return from Europe in March, 1847, Wells proceeded at once to make known to the public his experiments of November and December, 1844; only, instead of "twelve or fifteen," which were all he laid claim to in his "Hartford Courant" letter of December 7, 1847, or in his letter to the "Boston Medical and Surgical Journal" of May 12, 1847, Wells now made the broad statement that he had "administered nitrous-oxide gas and the vapor of ether to about fifty patients," his operations, he says, having been limited to this small number in conse-

quence of a protracted illness, which immediately ensued on his return home from Boston in January, 1845.

Wholly forgetful that he had already recognized Morton's discovery, and had written to him that it would prove a fortune, Wells now contended that he had preoccupied the ground two years before Morton's adoption of sulphuric ether. Wells maintained that surgical anæsthesia "did not consist in the use of any one specific gas or vapor; for anything which will cause a certain degree of nervous excitement is all that is required to render the system insensible to pain. Consequently, the only question to be settled is, which exhilarating agent is least likely to do harm."

An active coadjutor of Wells — Dr. E. E. Marcy, also of Hartford — supported this line of argument by saying: "The man who first discovered the fact that the inhalation of a gaseous substance would render the body insensible to pain under surgical operations, should be entitled to all the credit or emolument which may accrue from the use of any substance of this nature. This is the principle; this is the discovery. The mere substitution of ether-vapor, or of any other article for gas, no more entitles one to the claim

of a discovery than the substitution of coal for wood, in generating steam, would entitle one to be called the discoverer of steam."

This argument might have had weight, perhaps, if the experiments made by Horace Wells had been conclusive, or uniform in their results; but they were not, nor were they so considered by Wells himself, as has already been shown. By his process of reasoning, the discovery might be said to have been made forty-seven years before, — a fact of which Wells was probably wholly ignorant, — by Sir Humphrey Davy, who in 1799, in a long dissertation, published in the Proceedings of the Royal Society, entitled, "Researches on Nitrous-Oxide Gas," p. 566, uses the following language: —

"In one instance, when I had a headache from indigestion, it was immediately removed by the effects of a large dose of gas, nitrous-oxide; though it afterward returned, but with much less violence. In a second instance, a slighter degree of headache was wholly removed by two doses of gas.

"The power of the immediate operation of the gas, in removing intense physical pain, I had a very good opportunity of ascertaining.

"In cutting one of the unlucky teeth called *dentes sapientiæ*, I experienced an extensive inflammation

of the gum, aeeompanied with great pain, whieh equally destroyed the power of repose and of eonsistent aetion. On the day when the inflammation was most troublesome, I breathed *three large doses* of nitrous-oxide. The pain always diminished after the first three or four inspirations ; the thrilling eame on as usual, and the uneasiness was for a few minutes swallowed up in pleasure. As the former state of mind, however, returned, the state of the organ returned with it; and I onec imagined that the pain was more severe after the experiment than before.

Towards the conclusion of his essay, Sir Humphrey says: —

"As nitrous-oxide, in its extensive operations, appears eapable of destroying physieal pain, it may probably be used with advantage during surgieal operations in whieh no great effusion of blood takes plaee."

Failing to acquire any credit for an original discovery, a desperate effort was made by Wells and his friends to revive the usc of nitrous-oxide gas as a surgical anæsthetic, evidently with the hope of being able to connect some subsequent experiments (if they could be made successful) with those past efforts which had failed and been abandoned, — hoping thus, out

of the two series, to prove nitrous-oxide a practical anæsthetic, and to establish Wells's claim that his experiments constituted the first effectual discovery of surgical anæsthesia.

With this end in view, Wells in 1847 repeated his Boston experiment with nitrous-oxide gas, in the amphitheatre of the New York Hospital, before distinguished physicians and surgeons; but again, although he now possessed the experimental knowledge of anæsthesia produced by ether, he absolutely failed in his undertaking.

On August 17, 1847, however, Dr. E. E. Marcy successfully removed a scirrhous testicle while the patient was under the influence of nitrous-oxide. The patient at the first incision manifested some pain; but afterward, until the operation ended, there was not the slightest consciousness. On January 1, 1848, Dr. Pinckney W. Ellsworth amputated the thigh of Henry A. Goodale, of East Hartford, a boy of fourteen. The gas in this case did not prove entirely satisfactory, but the pain was essentially relieved. On January 4, Dr. S. B. Berresford removed a fatty tumor, weighing six and a half ounces, from the shoulder of Mary Gabriel, of Bristol, Conn., a state of anæsthesia, "closely bordering on asphyxia," having been produced by the gas.

In all of these cases the nitrous-oxide was administered by Wells.

His attention being attracted by the activity which Wells and his partisans were manifesting, Dr. H. J. Bigelow determined to submit nitrous-oxide to a practical test, and, with a sufficient supply of gas, to judge for himself as to its adequacy in surgical practice. Accordingly, on April 27, 1848, at the Massachusetts General Hospital, he removed a cancerous breast from a woman forty-five years old while she was under the influence of nitrous-oxide. She inhaled the gas through a double mouthpiece, it being supplied under moderate pressure from two large copper gasometers, sixty gallons of gas being consumed. There was no outcry or other evidence of suffering on the part of the patient; but no one who watched her livid features could fail to see that nitrous-oxide gas was not a safe anæsthetic, or appropriate in any but the briefest cases of operative surgery. It required a self-possessed and experienced operator to persevere with the dissection during the intense state of asphyxia which was induced by the gas, especially as this asphyxia was obviously the sole cause of the anæsthesia.

To satisfy himself completely that asphyxia

produces anæsthesia, Dr. Bigelow, on two occasions, not long after the operation above alluded to, experimentally administered the inhalation of atmospheric air from a common gas-bag. As the carbonic acid replaced the oxygen, — or as the oxygen became diminished in the bag, — both patients became livid, and apparently insensible. One of the two really was insensible. The other was nearly so; but being a plethoric subject, it was not deemed prudent, in his case, to push the inhalation further. It may here be parenthetically remarked that if Dr. Morton had really meant to administer atmospheric air when he told Dr. Jackson his story about the refractory patient, his unfortunate subject might have been rendered insensible, perhaps fatally so, by asphyxia.[1]

[1] Dr. Bigelow was always quick to investigate new hints in regard to anæsthetics. Methylene was experimented with as soon as it could be obtained from London. In 1861, his attention was directed by Mr. Merrill, of the Downer Kerosene Oil Works, to an extremely volatile petroleum product with a boiling point of ninety degrees Fahrenheit, known to manufacturers as "kerosolene." Believing that it would prove efficient as an anæsthetic, Dr. Bigelow caused it to be tried upon himself; and an insensibility of several minutes was produced, which might well have been prolonged but for symptoms of asphyxia and a weakening of the pulse. Dr. Bigelow also gave it to three surgical patients, with anæsthetic success; but as

Disappointed by the inadequacy of his simple claim to the discovery of anæsthesia by nitrous-oxide, Horace Wells next boldly asserted that "while we had the subject under consideration," a surgical operation was performed upon a person under the influence of sulphuric ether, in November, 1844, by Dr. E. E. Marcy. In support of this statement, Dr. Marcy himself declared that having seen Wells extract a firmly set bicuspid tooth from F. C. Goodrich the same year, without occasioning the slightest sensation of pain, and knowing, to

the threatening indications above mentioned manifested themselves in each case, it was not thought wise to experiment further with this agent. — *Boston Medical and Surgical Journal, July* 11, 1861.

Having frequently and successfully employed Mr. James Arnott's glacial anæsthesia (the method of rendering parts insensible by a freezing mixture of ice and salt), Dr. Bigelow was immediately reminded of the volatile character of kerosolene when Dr. B. W. Richardson, of London, in 1866, proposed to induce local anæsthesia by the intense cold resulting from the atomization of ether. He at once obtained from Mr. Merrill a still more volatile product of petroleum distillation, having a boiling point of sixty degrees Fahrenheit, to which he gave the name of "rhigolene." By the atomization of this liquid, local anæsthesia was very rapidly obtained; but so intense was the resultant degree of cold that rhigolene was soon abandoned, being deemed unsafe for practical purposes. — *Boston Medical and Surgical Journal, April* 19, 1866.

use Marcy's own words, "that the inhalation of sulphuric-ether vapor gave rise to precisely the same effects as those of the gas from numerous former trials with both these substances,[1] I suggested to Dr. Wells the employment of rectified sulphuric ether, at the same time detailing to him its ordinary effects on the economy, and the method of preparing the article for use. Not long after this conversation [between Wells and Marcy on the subject of ether inhalation, referred to in an affidavit of F. C. Goodrich], I administered the vapor of rectified sulphuric ether in my office to the young man alluded to [in the above mentioned conversation]; and after he had been rendered insensible to pain, I cut from his head an encysted tumor of about the size of an English walnut." The further use of ether was abandoned, says Dr. Marcy, because Wells and himself came to the conclusion that nitrous-oxide was safer, more agreeable, easier to inhale, and equally efficacious.

The above statement is absolutely all the evidence ever adduced in support of this more than doubtful case. The circumstance itself was not made known until published in an affidavit by Dr. Marcy, dated December 1, 1849, five years

[1] A fact already known in 1818. See page 15.

after the alleged occurrence, wherein he stated that about the time of Wells's first painless tooth-extraction, "he [Marey] performed the operation above described on the young man alluded to," but whose name he declared he had forgotten. There is no evidence whatever that Wells made any allusion to sulphuric ether when, in 1845, he communicated the successful result of his earlier exhibition of nitrous-oxide gas to Dr. Morton and Dr. Jackson, at the time of his unfortunate experiment in Boston. In Wells's letter of December 7, 1846, there is not the slightest intimation that sulphuric ether had been used as an anæsthetic prior to Morton's demonstration of September 30. Nor in this letter does Wells pretend to anything but speaking of sulphuric ether, — then more than two months in use, — to Dr. Marey, and rejecting it by his advice. In the subsequent letter, however, published while Wells was in Paris, in "Galignani's Messenger," of February 7, 1847, he says: "Since this discovery [of surgical anæsthesia] was first made, I have administered nitrous-oxide gas and the vapor of sulphuric ether to about fifty patients," — leaving it to be inferred by the cursory reader, though it is by no means distinctly stated, that he had used sulphuric ether

before it was brought into public notice by Dr. Morton.

Soon after his return from Europe, in answer to a direct question from Dr. George Hayward, Wells acknowledged that he had never used sulphuric ether by inhalation, so as to render any one insensible to pain.[1]

In October, 1852, Dr. Morton interested himself actively to obtain some positive information of this alleged etherization, and offered a reward of one hundred dollars, through the medium of the "Hartford Courant," to any one who could tell who was the person operated upon by Dr. Marcy, or give any facts whatsoever concerning the alleged occurrence. He also employed Horace Cornwall, a Hartford lawyer, to institute a search in the matter. On January 10, 1853, Morton received the following letter from that gentleman: —

"Since you announced in Hartford, last October, that you would give a reward of one hundred dollars to any one who would discover to you the young man from whose head Dr. E. E. Marcy extracted a tumor, under the influence of ether, mentioned by him in an affidavit, I have made great efforts to find

[1] See Deposition of G. Hayward. Answer to Interrogatories 16 and 17.

the individual alluded to. I have inquired of all the physicians and surgeons in this city who were here as far back as 1844, and of two students of Dr. Marcy, — one of whom was with him about the time he claims to have performed the operation, — and also of the citizens of Hartford and adjoining towns; and I personally offered the reward of one hundred dollars to P. W. Ellsworth, the agent of Mrs. Wells, if he would find the person, and inform me who he was. I also offered a like sum to the counsel of Mrs. Wells personally, and also to F. C. Goodrich, and many others of the friends of Mrs. Wells, who I supposed would be likely to know who the person was. But with all my efforts I have not been able to find any such person as is mentioned by Dr. Marcy, or any one upon whom he operated under the influence of ether, previous to the time you perfected your discovery in 1846; nor any one who could give me any information as to who it was."

Discredited by the accompanying asphyxia, and by the inconveniences of its administration, attempts to introduce nitrous-oxide into general surgery were abandoned. The method of use at present so largely adopted in dentistry came about mainly through the operation performed with this agent by Dr. Bigelow. The substitution of the large volume of gas contained in a

gasometer for the small quantity containable in a gas-bag, was the vital step from failure to success in the use of nitrous-oxide. Although this was pointed out in 1848, it was not until fifteen years afterward, through the business energy of Mr. Colton, whose name has already been mentioned in connection with the early history of this gas, that this modification in the administration of nitrous-oxide anæsthesia made it the unfailing resource in tooth-pulling it now is (but never was in the hands of Horace Wells), as well as an adequate agency, wherever a sufficiency of gas is available, for the painless performance of operations involving only a short space of time.[1]

[1] G. Q. Colton, not being a dentist or physician, had no occasion to practise anæsthesia as such. But he acquired an immense experience by his public exhibitions in administering nitrous-oxide gas. For six months in each year, from 1843 to 1863, he gave each week at least two public exhibitions of laughing gas, and sometimes three or four, usually administering it to twelve or fifteen persons on each occasion. During this long period the only anæsthetic use of nitrous-oxide made by Mr. Colton was in the experiment successfully tried on Horace Wells, Dec. 11, 1844.

In June, 1863, at the solicitation, and in connection with, Dr. J. H. Smith, a dentist of New Haven, Conn., Colton began the preparation and administration of nitrous-oxide gas on a large scale, for what might be called the specialty of extracting teeth; and it is alleged that in that single month of June Dr.

Horace Wells died suddenly in New York, January 24, 1848, at the age of 33, after the commission of extraordinary acts foreign to the blameless character of his previous life. It can the more readily be believed that Wells was not responsible for these acts, since his biographer, Dr. P. W. Ellsworth, says that his condition at the time of his death was "brought about by experimenting on himself to a dangerous extent with the powerful and almost unknown agent chloroform, of which he had formed the impression that it was a better agent than nitrous-oxide gas."

Volatile, ingenious, enterprising, as an experimenter Wells was, like scores of others in the field of anæsthesia, unsuccessful in establishing

Smith extracted seventeen hundred and eighty-five teeth. This success led Mr. Colton to remove to New York city early in July, 1863, and with the assistance of Dr. John Allen as dentist, to establish the "Colton Dental Association," having for its sole object the painless extraction of teeth by nitrous-oxide anæsthesia. During the first six months of this enterprise no record of patients was kept. Subsequently, up to Jan. 1, 1867, seventeen thousand six hundred and one persons registered, with an average extraction of two and a fraction teeth apiece. In 1866 branch "Associations" were opened in Philadelphia, Baltimore, St. Louis, Cincinnati, Brooklyn, and Boston. At that date Colton had probably administered nitrous-oxide gas, or caused it to be administered, twenty-five thousand times.

anything of value. So far as his labors went, he left scientific knowledge, as well as its application to art, just about where Davy left it half a century before. Nevertheless, he helped to keep the subject alive, and unintentionally planted in the mind of his ambitious partner the seed which finally yielded fruit.

Dr. Long's Claim.

Perhaps the most startling claim to have been the original discoverer of anæsthesia by ether was that made by Dr. Crawford W. Long, a graduate of the University of Georgia (then Franklin College), in 1835, and of the Medical Department of the University of Pennsylvania in 1839. Dr. Long practised at Jefferson, Jackson County, Georgia, until 1850, when he moved to Athens, in Clarke County, of the same State. He lived in a community where "ether frolics" were common. He says they were "fashionable in this county [Jackson], and extended from this place [Jefferson] through several counties in this part of Georgia." Insensibility was not an unknown result of the venturesome inhalations sometimes indulged in.

Three years after surgical anæsthesia had been

introdueed and popularized, Dr. Long eontributed a paper to the "Southern Medical and Surgieal Journal" of December, 1849, in which he stated, that, prior to 1846, in five surgieal operations performed by him at Jefferson, Georgia, he had produced insensibility to pain by the administration to the patient of sulphuric ether. Three of these operations he elaims to have performed in 1842, one in 1843, and one in 1845. The first operation was the removal of a small eneysted tumor, half an inch in diameter, from the back part of the neck of James M. Venable, Mareh 30, 1842. The second operation was the removal of another small encysted tumor from the same gentleman's neek, June 6, 1842. The third operation was the amputation of the toe of a negro boy, Jaek, belonging to Mrs. Hemphill, July 3, 1842. The fourth operation was the removal of a small eneysted tumor from the head of Mrs. Mary Vineent, Sept. 9, 1843. The fifth operation was the amputation of the finger of a negro boy belonging to Ralph Bailey, Sr., Jan. 8, 1845.

Dr. Long says: "The question will no doubt oeeur, Why did I not publish the results of my experiments in etherization soon after they were made? I was anxious before making my publi-

cation to try etherization in a sufficient number of cases to fully satisfy my mind that anæsthesia was produced by the ether, and was not the effect of the imagination, or owing to any peculiar insusceptibility to pain in the persons experimented on." He also says: "I determined to wait . . . and see whether any surgeon would present a claim to having used ether by inhalation in surgical operations prior to the time it was used by me."

Dr. Long admits himself that his cases were virtually failures; that the "state of exhilaration," as he terms it, was an imperfectly anæsthetic one; that on the whole he found ether impracticable, and therefore abandoned it. Nevertheless, in 1853, at a meeting of the State Medical Association held at Savannah, he presented a claim to have made the discovery of painless surgery.

No one repeated Dr. Long's experiments. Not a physician or surgeon ever used ether because Long had used it; nor did mankind learn from him that anæsthetic inhalation for surgical purposes was possible. Indeed, nothing further would have been heard of these cases, or of the paper recording them, if in May, 1877, in the "Virginia Medical Monthly," Dr. J. Marion

Sims, — a resident of New York, but a South Carolinian by birth, — had not published an article recalling Long's manifesto, and declaring him to be the "real discoverer of anæsthesia," — a claim made after the fact, and resting on no better foundation than those claims similarly made by other aspirants for the distinction; a class so numerous as to have been named by the "London Lancet" the class of Jump-up-behinders.

The aim of Sims's publication was apparently achieved. In August, 1879, the double portrait of Drs. Long and Sims, — the gift of a single individual, H. L. Stuart, of New York, — was presented to the Legislature of Georgia, and hung in the Hall of the House of Representatives in the State Capitol.[1]

[1] Dr. Sims's course, in his somewhat active relation to the alleged discoverers of surgical anæsthesia, has been so erratic, and is so illustrative of the bewilderment which the diversity of their pretensions has occasioned, that it well deserves notice in this connection. In June, 1858, a meeting of physicians "interested in raising a national testimonial for the benefit of the discoverer of anæsthesia," and in making an "appeal to the public for this purpose by the members of the medical profession in New York," was held at the house of Dr. Willard Parker, in that city. In the address issued shortly afterward, they say: "Dr. Morton's claim to this remarkable discovery is established beyond all controversy, and his merit in this re-

Chloroform and Dr. Simpson.

Chloroform was discovered by Dr. Samuel Guthrie, early in 1831, "at his laboratory in the woods," near Sackett's Harbor, New York,

spect, with those who have taken the trouble to inform themselves on the subject, can be no longer a question of dispute." At this meeting Dr. J. M. Sims was appointed one of a committee "to confer with gentlemen out of the profession as to the most efficient means of accomplishing the end in view;" and on another committee, consisting of "one from the medical board of each public charity of the city and its vicinity, to wait upon the boards directing the various institutions, and solicit donations in behalf of the object," Dr. Sims represented both the New York Academy of Medicine and the Woman's Hospital.

In May, 1873, a public meeting, "to give notoriety to which a good deal more than ordinary pains were taken," was organized, and held in Steinway Hall, New York city. It was proposed to raise money, which was "to benefit the widow of the late Dr. Wells, who discovered the use of anæsthetic agents." At this meeting Dr. J. M. Sims was the first speaker, and his subject was the History of Anæsthetics. "To my mind," he said, "it is as clear that Wells was the discoverer of anæsthesia, as it is that Columbus was the discoverer of America."

Without the citation of any new evidence, Sims gave to Wells the credit he once gave to Morton, — a change of opinion so radical and so marked, that the public and the profession would have been interested to hear out of curiosity, if for no other reason, the grounds upon which it was based.

In 1876 Dr. Sims writes: "For more than a year I, with some of my friends, have been organizing a plan to introduce

and subsequently by Soubeiran, in the same year, and by Leibig in 1832. Each of these discoveries came through independent and original investigations.

In October, 1847, Dr. James Y. Simpson, of Edinburgh, spoke to Mr. David Waldie, Analytical Chemist to the Liverpool Apothecaries' Company, about his (Simpson's) endeavor to find something to supersede sulphuric ether, and his trial of certain vapors, among others of chloric

a bill into Congress, asking an appropriation of two hundred thousand dollars, to be divided equally between the representatives of the two men, Wells and Morton, who were instrumental in giving to the world one of its greatest blessings, anæsthesia."

In 1877 Dr. Sims discovers Dr. Long; and thereupon United States Senator Gordon, at the presentation of the portrait, as above mentioned, to the Legislature of Georgia, said: "We are indebted mainly to Dr. J. Marion Sims for the final and almost unquestioned recognition of Dr. Long as the real discoverer of anæsthesia."

In March, 1880, Dr. Sims was active, in connection with the Hon. Alexander H. Stephens, of Georgia, in again promoting a Congressional bill, asking an appropriation for the discoverers of anæsthesia, the sum appropriated to be divided equally between the families of Long, Wells, Morton, and Jackson. Both of Dr. Sims's attempts to get a bill before Congress were abandoned, chiefly on account of Mrs. Morton's unwillingness, by any compromising alliance with other claimants, to depreciate the credit which she believed belonged solely to her husband.

ether, of the chemical nature of which he was ignorant. Mr. Waldie explained to Sir James that in using this ether it was the vapor of alcohol chiefly which would be inhaled, and advised him to try the proto-chloride of formyle, or chloroform, from which chloric ether was made at the Liverpool Laboratory.

Finding that by the conventional mode of manufacture chloric ether was of unequal strength, Mr. Waldie had adopted the process of washing out from distilled chloride of lime and alcohol all extraneous matter, and then dissolving the residual chloroform in a measured quantity of pure spirit. By this means the quality and the strength of chloric ether were rendered uniform. Mr. Waldie had therefore made himself familiar with the principal properties of chloroform, and knew it to be a volatile liquid, yielding a pleasant and fragrant odor, and appropriate for Dr. Simpson's experiments.

Following up Mr. Waldie's recommendation, Dr. Simpson procured a specimen of chloroform from Duncan and Flockhart, Edinburgh chemists, — Mr. Waldie's laboratory having just then been destroyed by fire.

Dr. Simpson appears to have ascertained the anæsthetic properties of chloroform during some

subsequent desultory experiments in the inhalation of various drugs, made around a supper-table late at night in his own dining-room, in company with Dr. Keith and Dr. J. Matthews Duncan, some ladies of the Simpson family, and a naval officer who was a brother-in-law of Dr. Simpson. An account of this adventure speaks of "one of the ladies gallantly taking her place and turn" to inhale the vapor, as it arose from a saucer into which some chloroform had been poured from Duncan and Flockhart's bottle, which Dr. Simpson had previously set aside on a lumber table, but was now prompted to try, and which he picked up almost at random from where it lay half hidden beneath a heap of waste-paper.

As a result of this inhalation, all three of the gentlemen engaged in the experiment fell to the floor in a state of insensibility; and not long afterward chloroform was adopted at the Royal Infirmary of Edinburgh as a surgical anæsthetic.

Thus was brought about what was called "the triumph of 1847," which made Dr. Simpson "the greatest benefactor of his age."

The particulars of these facts are recorded in "The True Story of the Introduction of Chloroform into Anæsthetics, being the Original Ac-

count of it given in 1847, and a Restatement in 1870; by David Waldie, Linlithgow, 1870;" and in the "Lancet" of July 26, 1890.[1]

The object in alluding to these occurrences is to relate an incident, perhaps not irrelevant or uninteresting. In 1869 the Lord Provost of Edinburgh, in presenting the freedom of the City of Edinburgh to Sir James Y. Simpson, recently knighted, took occasion in his address to give him the credit for the "greatest of all discoveries of modern times, — the application of chloroform to the assuagement of human suffering." This seemingly exclusive assumption, shutting out the American hemisphere from any affiliation with the subject, Sir James allowed to pass without correction; and in the Encyclopædia Britannica, edition of 1854, in the article entitled "Anæsthesia, — see Chloroform," — written by Dr. Simpson himself, — he claimed much the same credit as the Lord Provost of Edinburgh subsequently and so gratuitously ascribed to his fellow-townsman; although in the "Edinburgh

[1] The word "anæsthesia" (see p. 26) was declared to have been "coined and introduced into our nomenclature in 1847 by the late Dr. Simpson;" and as recently as August 2, 1890, Lawson Tait speaks of "the year 1847, when there first fell upon man that gentle slumber, anæsthesia." See "British Medical Journal," August 2, 1890.

Monthly Medical Journal" for September, 1847, Simpson had already described Dr. Morton as "the gentleman to whom the profession and mankind are really and truly indebted for first reducing into practice the production of insensibility by ether-inhalation, with the object of annihilating pain in surgical operations." In fact, almost on the very day of his chloroform experiment, November 12, 1847, Dr. Simpson had written to Dr. Morton, and referred to this magazine article as "vindicating your [Morton's] claims over those of Jackson," and adding, "of course the great thought is that of producing insensibility; and for that the world is, I think, indebted to you."

This perversion of truth was emphatically exposed by Dr. Jacob Bigelow, in two open letters in the "Boston Daily Advertiser" of March 19, 1870, which most effectually cleared up any mistaken impressions in regard to Dr. Simpson's relations to the discovery of chloroform, of surgical anæsthesia, or of an agent in any way supplanting sulphuric ether. This was done in a manner so admirable, and in language of such characteristic force and elegance, as to attract very general attention.

Chloroform had a short career in Boston.

This was largely owing to the uninterrupted success of ether; and in part, perhaps, to the fact that in November, 1852,[1] one patient died, and another narrowly escaped death on the same day in the operating theatre of the Massachusetts General Hospital, from the accidental use of a large quantity of chloroform by mistake for chloric ether.

Chloric ether — practically a strong solution (ten per cent) of chloroform in alcohol — had likewise a comparatively brief career. In December, 1852, it was stated that "chloric ether had been used until very recently by two of the six surgeons connected with the Massachusetts General Hospital, but not by the others."[2]

Appeal to Congress.

In December, 1846, Morton began his long contest at Washington, by urging upon Congress the adoption of his discovery in the medical departments of the army and navy of the United States, then engaged in the Mexican War. On the reception of a few letters unfavorable to the

[1] Boston Medical and Surgical Journal, November 24, 1852.

[2] See Deposition of H. J. Bigelow. Answer to Cross-Interrogatory 144.

discovery, written by those who were beginning to array themselves against any action in Morton's behalf, the committee to whom the subject was referred quickly closed their investigation. Professor Mutter, of Philadelphia, for example, deprecating their endorsement of ether, wrote to the Committee: "I trust the day is far distant when we shall find so distinguished a body as our National Congress lending itself to the advancement of quackery in any shape."

In a letter dated January 18, 1847, the use of ether was again urged upon the heads of the army and navy departments, — the Mexican War being still in progress, — with the stipulation that each administration should cost only one or two cents; but owing to the professional distrust with which all innovations on old-established practice were looked upon, the proposal was rejected. The narrow-mindedness of this rejection was outdone, however, when the United States government, disregarding and ignoring the patent already issued to Morton, unscrupulously used ether on the battlefields of Mexico, especially along General Winfield Scott's line, without contemplating any compensation to the discoverer. Nothing could have more fatally smitten the validity of this covenant, in public

than such an infraction of the patent by the very power which granted it.

In April, 1847, Morton's agents engaged in selling licenses first learned that there was a controversy as to the discovery, and that hospitals were employing ether without the requirement of a royalty. When the army and navy appropriated the discovery, then everybody was encouraged to seize upon ether-anæsthesia regardless of patent restrictions. Any further sale of licenses was out of the question, and Morton's hopes of direct pecuniary results were irreparably destroyed. His only recourse was to apply to his country for compensation and redress.

Between 1849 and 1863, numerous reports were made by committees of the United States House of Representatives and the Senate on the subject of a recompense for the discovery of surgical anæsthesia. On account of the uncompromising antagonism of Dr. Jackson and the representatives of Horace Wells to every step taken on Dr. Morton's behalf, and the acrimonious partisanship of individual members of Congress, together with the perplexities of the question itself, the various recommendations submitted from time to time for legislative ap-

proval were defeated, obstructed, buried among the accumulations of unfinished business left by the adjournments of Congress, or rejected in the confusion of midnight sessions. More than one thousand printed pages of testimony of the highest importance accompanied these reports.

By one of the committees to whom the subject of indemnity was confided, it was advised that an outright reward of a hundred thousand dollars be voted to Dr. Morton. In another report no definite sum was mentioned; but a simple resolution was offered that an appropriation should be made for the benefit of the discoverer, the title to the discovery to be settled in a court of justice. By still another recommendation the relinquishment of the patent was to be made the condition of compensation.

A proposition to divide an award in such proportions as the merits of the respective claimants might determine, was at once voted down by the members of the House of Representatives under the lead of Alexander H. Stephens, of Georgia, late Vice-President of the Southern Confederacy, with the cry of, "A bargain! a bargain!" and the impression that there was a bargain on foot could not be eradicated.

In June, 1854, hopeless of any action by Congress, Morton memorialized the President of the United States, praying him to give compensation for the use of the discovery of practical anæsthesia, or to issue the necessary orders to medical officers who were under national control, to desist from further infringement of the patent right. The President received the application, and was about to order a just and liberal compensation, when the Secretary of War, Jefferson Davis, induced him to require, as a prerequisite, a suit in one of the United States courts, and a judgment against a government surgeon for using ether without compensation to the patentee. Dr. Morton brought such a suit, and recovered judgment against Dr. Charles A. Davis, Physician and Superintendent of the United States Marine Hospital, Chelsea, Mass. In due time, though after a change in the Administration, he presented the record of this judgment to Howell Cobb, then Secretary of the Treasury, to which executive department the Marine Hospitals belonged; but Cobb hesitated for a time, and finally refused to carry out the order until Morton had tested his claim by further suits.

In the mean time the patent was drawing to the close of its legal duration of fourteen years.

Morton applied for an extension, in the hope that Congress would recognize his rights under it at some time during the extended term; but the extension was refused on technical grounds.

In December, 1862, a suit was brought by Morton in the Circuit Court of the United States for the Southern District of New York, against the New York Eye Infirmary for the use of ether in violation of his patent right. An opinion adverse to the plaintiff was rendered by the Hon. Judge Shipman, whose decision was subsequently concurred in by the Hon. Judge Nelson of the Supreme Court.[1]

It may here be stated that Dr. Morton's eminent counsel, Richard H. Dana, Jr., early advised him that he could not patent anything except his mechanical instrument for administering the ether. "I am sure I was right," writes Mr. Dana, in a letter of March 3, 1880, addressed to a member of Dr. Morton's family, for "when it was found that no mechanical method was necessary or useful, the patent fell; because all there was left was a fact in Nature that had always existed, and was universal in its character, self-acting, and now for the first time ascertained."

[1] American Law Register, September. 1863.

The right to patent Morton's discovery as a "new and useful art" was, however, sustained by high authorities. Daniel Webster, among others, endorsed this opinion.

In 1856, chiefly at the philanthropic instigation of the Hon. Amos A. Lawrence, of Boston, one of the Trustees of the Massachusetts General Hospital, an "Appeal to the Patrons of Science and the Friends of Humanity" was made in behalf of a National Testimonial for the benefit of Dr. Morton. This was very generally supported by scientific and professional organizations and hospitals, and by public men, financiers, and philanthropists; but nothing ever came of it in the way of pecuniary profit.

In recognition of his beneficent discovery, Dr. Morton was invested by Russia with the Order of Saint Vladimir; and by Sweden with the Order of Vasa. A sum of one thousand dollars, in a silver box, was presented to him early in the history of anæsthesia by ether. The front of this box was inscribed: "Testimonial in honor of the Ether discovery of September 30, 1846." Upon the lid were the words: "This box, containing one thousand dollars, is presented to William Thomas Green Morton by the Members of the Board of Trustees of the Massachusetts

General Hospital, and other citizens of Boston, May 8, 1848." Under this is a line quoted from a then recent Hospital Report: "He has become poor in a cause which has made the world his debtor."

In 1850 Dr. Morton received from the French Academy a Montyon Prize. This prize, awarded to "Benefactors of the Human Race," and valued at twenty-five hundred francs, was put into the shape of a gold medal with a massive gold frame, and is now in the Collection of the Massachusetts Historical Society. A movement in Great Britain to raise a sum estimated at ten thousand pounds, which was considered as secured, was rendered nugatory by the possible contingencies which the Ether controversy developed.

An immense amount of money was expended in Washington in Morton's struggle for a reward, — no one knows how much. The turmoil and excitement of the controversy was increased in 1855 by the discovery that a defaulting Railroad Treasurer had invested fifty thousand dollars of his embezzled funds in the uncertain speculation of a Congressional appropriation for Dr. Morton's discovery. Justice to Dr. Morton, however, requires it to be said that he was in

absolute ignorance of the circumstanees under which this money was advanced.

Dr. Morton exhausted his own means, as well as his health and strength, to vindicate and establish his claim. His home was broken up, and he became irrevocably involved in debt for travelling, hotel expenses, law fees, and a variety of services performed for him by others.

The prolonged inquisition and debate, covering so many years, served nevertheless to make it clear to unprejudiced minds, whatever others may have thought and reasoned and suggested, that Morton alone gave the discovery of practical anæsthesia to the world.

It has been eloquently said: "Dr. Morton found the practice of ether inhalation an amusement of chemical lecture-rooms and schools; he left it the sovereign anodyne of the human race in its moments and hours of agony. He found ether-stupor as hazardously uncertain as was the narcotism produced by pouring down the opium *à boire* of Canappe; he left it as manageable as the sleep which follows a dose of laudanum."

Dr. Morton's Death.

Dr. Morton died July 15, 1868, of apoplexy, which attacked him while driving in Central Park, New York. The attack was induced, as it was thought, in his already impaired state of health, by a publication just then issued in behalf of Dr. Jackson, of a nature to prejudice the National Testimonial Subscription, which was circulating for Morton's benefit.

The following epitaph, written by Dr. Jacob Bigelow, may be read on Dr. Morton's tomb at Mount Auburn:—

W. T. G. MORTON
BORN AUG. 9 1819
DIED JULY 15 1868
INVENTOR AND REVEALER OF ANÆSTHETIC INHALATION
BEFORE WHOM IN ALL TIME SURGERY WAS AGONY
BY WHOM PAIN IN SURGERY WAS AVERTED AND
ANNULLED
SINCE WHOM SCIENCE HAS CONTROL OF PAIN
ERECTED BY CITIZENS OF BOSTON

The Public Garden of Boston contains a monument presented to the city in June, 1868, by a liberal citizen, Thomas Lee, which was in-

tended simply to identify Boston as the birthplace of a great discovery. It bears these words: —

TO COMMEMORATE
THE DISCOVERY
THAT THE INHALING OF ETHER
CAUSES INSENSIBILITY TO PAIN
FIRST PROVED TO THE WORLD AT THE
MASSACHUSETTS GENERAL HOSPITAL IN BOSTON
OCTOBER A. D. MDCCCXLVI

IN GRATITUDE
FOR THE RELIEF
OF HUMAN SUFFERING
BY THE INHALING OF ETHER
A CITIZEN OF BOSTON HAS ERECTED
THIS MONUMENT
A. D. MDCCCLXVII

The lapse of time has but magnified and confirmed Dr. Morton's right to consider every human being his debtor. This right, now an inheritance of his family, should at least be recognized by a conspicuous and public inscription of Dr. Morton's name in some monumental connection with the city in which surgical anæsthesia originated. Such a recognition would

substantiate the words of Dr. Jacob Bigelow, that "the suffering and now exempted world have not forgotten the poor dentist who, amid poverty, privation, and discouragement, matured and established the most beneficent discovery which has blessed humanity since the primeval days of Paradise." It would reward the loyalty of an enduring woman, — tempted, but refusing, to share divided honors, — who has said, in a letter to Hon. A. H. Stephens, April 3, 1880: —

"Sorely as I feel my dependence, in view of the inestimable blessing my husband conferred on the whole world, and by which his life for twenty-two years was one long and bitter contest, and to which in the prime of his life he succumbed, leaving his family penniless, I prefer poverty, and still further vexation and contest, even while life lasts, to resigning my inalienable right in the discovery of painless surgery, — all that my husband could bequeath to his wife and children."

Massachusetts General Hospital.

The discretion and moral courage which were instrumental in permitting the introduction of a disguised and only partially known anodyne into the Massachusetts General Hospital should not

be forgotten or passed by without mention. Even those who looked with no friendly eye on the attitude of Boston in this matter, candidly asserted that to the surgeons of this Hospital the world owes the immediate adoption of the anæsthesia of surgery. Although all responsibility for the act rested absolutely with the surgeons, the trustees of that institution, — a board of twelve gentlemen of the highest consideration in this community, — impressed by the beneficent and humane aspects of the situation, co-operated in every way to promote its acceptance. They awarded the right of discovery to Dr. Morton; and they befriended him personally, although he was a stranger to all of them, and Dr. Jackson was socially their friend. None of them were physicians, or engaged in similar pursuits with either of the claimants; but they took no narrow-minded or superficial view of the all-absorbing event. The active part they bore — under the lead of Mr. Nathaniel Ingersoll Bowditch — in the discussions and the inquiries of the time, contributed greatly to the favorable reception of anæsthesia, and to its prompt adoption in this community and elsewhere.

In the Annual Report succeeding the bold stroke which set in motion the use of ether, the

trustees of the Hospital record the fact that "within the walls of this building [the Massachusetts General Hospital] were witnessed the first painless operations that were ever performed." With pardonable pride they declare: "The world at large is in no small degree indebted to the medical and surgical officers of this institution. But for their immediate appreciation of this discovery, if Morton's overtures had been received with extreme caution, who can say what might have been the result? The enthusiasm of one of them, who was especially earnest in urging the performance of these operations, led him to become the first champion of ether in this country."

Dr. Henry Jacob Bigelow.

Dr. Bigelow's attitude toward the Ether discovery was conspicuous. Although at that period he was the junior surgeon of the Hospital, but twenty-eight years of age, and had been less than a year in office, while the surgeons on duty were greatly his seniors, and long accustomed to have their own way, his determination, his penetration into actuating motives, his executive ability, — in fact, all his sagacious and active

qualities of mind and body, — made him realize that the event of a lifetime was taking place. He was not, nor did he make an effort to be, one of the early operators with ether; but he threw his whole energy into guiding, perfecting, and pushing to a successful issue the great discovery which suddenly burst upon the community, at a point where the labor and the interests of his professional life were centred.

His immediate appreciation of the discovery on the very day of its demonstration; his clinical study, as it were, of the subject at Morton's office; his bold experiments, with the equally bold aid of Dr. John C. Dalton; his paper read at the Academy on November 3, 1846; his adroit management of the personal equations involved in the first capital operation, when he secured the presence of Dr. Morton at the Hospital; his indications, at an early period, of its multiform uses; his unremitting exertions to prove its safety; his practical supervision of etherization during the first year of its use; his numerous communications to newspapers, and his important essays on anæsthesia in medical journals; his trial of nitrous-oxide gas; his efforts to have the discovery properly recompensed, — all these facts have identified Dr.

Bigelow prominently with the whole subject of ether. His letter of January, 1848, to the Hon. Robert C. Winthrop, then Speaker of the National House of Representatives, forcibly illustrates his clear comprehension of the Ether controversy. As this letter is almost a mathematical solution of the problem at issue, no story of the discovery can be complete without its incorporation; and it is therefore appended at the close of this narrative.

So well were these facts known, even beyond the limits of Boston, that in the Centennial year of the Republic, 1876, Dr. Bigelow was immediately brought to mind as the only person practically qualified to write the article entitled "A History of the Discovery of Modern Anæsthesia," in a book called "A Century of American Medicine," which was published on that occasion as a memorial volume. The editor of the various articles, — written by different authors, and gathered together under the above title, — though himself a Philadelphian, in a few prefatory words to Dr. Bigelow's paper, speaks of him as having done "more than any other living person to bring it [the discovery] before the medical public of this country and of Europe, to assert its real value, and to point out the best

methods of utilizing it." It is not too much to say that this paper is the most complete and satisfactory resumé on record of the history of Surgical Anæsthesia.

Among the names, other than that of William Thomas Green Morton, identified with the momentous innovation by which at once, with safety and with certainty, — to quote the language of O. W. Holmes, — "the fierce extremity of suffering was steeped in the waters of forgetfulness, and the deepest furrow in the knotted brow of agony was smoothed forever," it must be admitted that the name of Henry Jacob Bigelow demands grateful remembrance. "To him," says Edward Warren, writing in Dr. Morton's behalf, "next to the discoverer himself, are the public and the world indebted for the blessing of so early receiving the great discovery in question; and I would pay this passing tribute, without derogating aught from those other noble names who, through evil and through good report, have been found in its defence." [1] During the days, and indeed years, of timidity, selfishness, and contention which the first use of ether inaugurated, Dr. Bigelow was the advocate of

[1] Boston Daily Advertiser, March 5, 1847.

humanity and the honor of medical science, resolutely determined that the discovery and promulgation of Surgical Anæsthesia should bring about the assuagement of human suffering in the surest, most comprehensive, and speedy manner.

APPENDIX.

I.

LETTER TO HON. R. C. WINTHROP.

BOSTON, Jan. 26, 1848.

Hon. ROBERT C. WINTHROP, WASHINGTON, D. C.

DEAR SIR, — I believe most fully that Dr. Morton deserves any reward Congress may grant to the discoverer; because, although many people have *thought* that a man could be intoxicated beyond the reach of pain, Dr. Morton alone *proved* this *previous possibility* to be A CERTAINTY and SAFE. A diagram will make the matter plainer than words: —

Before October, 1846, who made the suggestion? Here is the only ground of dispute.	Discovery in October, 1846. Consecutive experiments by Morton.	After October, 1846, Morton *alone* took the responsibility of danger, and proved that it was — (1) CERTAIN; (2) SAFE.

The last two points, — namely, the consecutive experiments, and their confirmation, — *which nobody disputes to Morton*, make him, in my eyes, the discoverer. The only doubt is, who made the *suggestion?* To me this is of no importance. Dr. Jackson says, "I did. I told Dr. Morton to try the experiment; and unless I had so told him, he would never have tried it." Dr. Jackson adds: "I first tried ether when I was suffering from chlorine in 1842. I afterwards recommended it to Mr. Peabody." But Dr. Morton confutes even these positions. He says to Dr. Jackson: "(1) I show by the evidence of Dr. Gould, Mr. Wightman, and Mr. Metcalf, that I was experimenting with ether before the interview in which you claim to have brought it to my notice. (2) In 1842 you only rediscovered what was before clearly in print in Pereira's Materia Medica. (3) You claim that you told Mr. Peabody what you *knew* of ether. Now you could not *know* it. You have stated all your grounds of deduction, and the widest inference you could draw from them is a *suspicion* of the properties of ether; and a *suspicion* in science, an *unconfirmed theory*, amounts to nothing. Finally, what you claim to have discovered in 1842 you kept to yourself during four years. Do you expect the world to believe you knew its value? Do you expect it to reward you for letting people suffer during that length of time? Besides, the suggestion of anæsthetic agencies occurred

to Davy; especially was it followed out, though unsuccessfully, by Horace Wells, who, disgusted with failure, abandoned his attempts." These and others had hypotheses as well as Dr. Jackson. Morton alone *proved* the hypothesis. Without Morton there is no evidence that the world would have known the anæsthesia of ether to the present day.

I believe this covers the ground of important argument and difference in the pamphlets.

Respectfully your obedient servant,

Henry J. Bigelow.

II.

OPERATIONS AT THE MASSACHUSETTS GENERAL HOSPITAL BETWEEN OCTOBER 18 AND DECEMBER 31, 1846, INCLUSIVE.

(An asterisk designates those in which Ether was used.)

October 20. Thomas Snow; admitted September 30. Sinus laid open for six inches, by Dr. J. C. Warren.

October 23. Harry Clarke; admitted October 19. Erectile Tumor on face and head. Ligature of common carotid artery, by Dr. J. Mason Warren. (First public operation of J. M. W.)[1]

October 23. F. Gaffney; admitted October 21. Radical operation for Hydrocele, by injection, by Dr. H. J. Bigelow.

October 27. Sarah A. Everett; admitted October 12. Exostosis on right humerus, beneath the deltoid muscle. One hundred drops of elixir of opium at nine o'clock, A. M. Incision four inches

[1] "For a surgeon comparatively young, the trial was the more severe from the fact that nothing was used to deaden the pain of the patient, as the employment of ether had not then been authorized by the authorities of the Hospital." *Memoir of J. M. Warren, M. D.*, p. 232.

long; dissection down to bone. Cut off with bone pliers, by Dr. J. C. Warren.

October 27. Ann Pepper; admitted October 27. Dislocation of humerus under coracoid, with fracture of anterior edge of glenoid cavity. Reduction by Dr. J. C. Warren.

October 28. Susannah Schmidt; admitted September 15. Ulceration of nose and throat. Introduction of seton in back of neck, by Dr. S. Parkman.

October 28. Asa Pettingill; admitted October 22. Posterior curvature of spine, with paralysis of lower extremities. Two setons passed on the sides of the spinal projection, by Dr. S. Parkman.

October 31. Polly Nickerson; admitted August 18. Introduction of seton, by Dr. S. Parkman.

November 3. G. M. Quimby; admitted November 3. Compound comminuted fracture of thumb, with laceration of the palm. Amputation of thumb, by Dr. S. Parkman.

November 7. * Alice Mohan, age 20; admitted March 7, 1845. Amputation of thigh, by Dr. George Hayward.

November 7. * Betsey Magoun, age 53; admitted November 2. Excision of a part of the lower jaw, by Dr. J. C. Warren.

November 7. Out-patient. Operation for hare lip, by Dr. J. Mason Warren.

November 16. Theophilus Petier, age 35; admitted thirty minutes after a railroad accident. Amputation of leg at upper third, by Dr. S. D. Townsend.

November 21. Charles Russell, age 20; admitted November 2. Polypus of nose. Ligature applied, by Dr. J. C. Warren.

November 21. Abel Farrington, age 41; admitted November 20. Fistula remaining after operation for cancer of the lip. Closed with stitches, by Dr. G. Hayward.

November 25. Sarah E. Coleman, age 23; admitted November 20. Fistula in ano. Lead-wire ligature, by Dr. G. Hayward.

December 5. Joseph Kells, age 56; admitted December 4. Fistula in ano. Operation of incision, by Dr. S. D. Townsend.

December 5. * Harriet C. Dana, age 55; admitted December 4. Scirrhus of breast. Excision, by Dr. G. Hayward. Ether administered by Dr. Morton. "During the operation she struggled considerably, and answered questions intelligently, but afterwards stated that she did not suffer pain, nor could she call to mind anything that had happened."

December 9. * William Eckels, age 30. Dislocation of shoulder twenty hours before admission. Reduced under ether, by Dr. S. Parkman. (Dr. Parkman's first operation with ether.)

December 12. Alonzo H. Reid, age 17; admitted December 8. Plastic operation of columna nasi, by Dr. J. Mason Warren.

December 12. John Brazer, age 46; admitted December 12. Operation for cancer of the lip, by Dr. G. Hayward.

December 12. * Mary Muldrave, age 58; admitted December 2. Malignant disease of upper jaw. Excision of superior maxilla, by Dr. J. C. Warren. Ether administered by Dr. Morton. "At the close of the operation patient was in good spirits, and stated that she knew nothing of what had been done."

December 13. * Felix Gaffney, age 47. Hydrocele. Radical operation performed October 23, followed by slough of scrotum. Plastic operation under ether, by Dr. H. J. Bigelow. (Dr. Bigelow's first operation with ether.)

December 19. Willard Wright, age 21; admitted December 18. Cicatrix of lip. Operation by Dr. J. Mason Warren.

December 22. * Elizabeth Johnson, age 58. Dislocation of shoulder, just previous to admission. Reduction under ether, by Dr. S. Parkman.

December 28. Alonzo H. Reid, age 17; admitted December 8. Repetition of operation of December 12, by Dr. J. Mason Warren.

III.

BIBLIOGRAPHY.

The following list of books, reports, pamphlets, etc., does not represent the complete Bibliography of Ether. It is, however, a fairly thorough enumeration of all the important literature bearing on the History of Surgical Anæsthesia, and especially of the Ether controversy. From November, 1846, until now Ether has been a theme of frequent discussion in the Medical Journals of all countries; but it has not been deemed advisable, in connection with the present narrative, to attempt to recapitulate a catalogue of articles so numerous and of such varying importance, especially as they have been already sufficiently registered in the Index Medicus, and in the Index Catalogue of the Library of the Surgeon-General's office.

Insensibility during Surgical Operations, produced by Inhalation. By Henry J. Bigelow, M. D. Boston Medical and Surgical Journal, Nov. 18, 1846, p. 309.

The Inhalation of an Ethereal Vapor to prevent Sensibility to Pain during Surgical Operations. By

J. F. Flagg, M. D. Boston Medical and Surgical Journal, Dec. 2, 1846.

Insensibility during Surgical Operations, produced by Inhalation. By H. J. Bigelow, M. D. (In reply to Dr. J. F. Flagg.) Boston Medical and Surgical Journal, Dec. 9, 1846.

Inhalation of Ethereal Vapor for the Prevention of Pain in Surgical Operations. By John C. Warren, M. D. Boston Medical and Surgical Journal, Dec. 9, 1846.

Inhalation of Ether. By J. Mason Warren, M. D. Boston Medical and Surgical Journal, March 24, 1847.

History of the Discovery of the Application of Nitrous-Oxide Gas, Ether, and other Vapors, to Surgical Operations. By Horace Wells. pp. 26. Hartford, Conn., March 30, 1847.

Some Account of the First Use of Sulphuric Ether by Inhalation in Surgical Practice. By George Hayward, M. D. pp. 8. Boston. Also, in Boston Medical and Surgical Journal, April 21, 1847, p. 229.

Some Account of the Letheon; or, Who is the Discoverer? By Edward Warren. Boston, 1847. Also an Appendix to the same, Revised and Enlarged. 1847.

Circular. Fifth Edition. Voice from Europe. Morton's Letheon. (No date.)

A Statement of the Claims of Charles T. Jackson, M. D., to the Discovery of the Applicability of Sul-

phuric Ether to the Prevention of Pain in Surgical Operations. By Martin Gay, M. D. Boston, May, 1847.

Painless Operations in Surgery. Littell's Living Age, Vol. XIII. No. 161, June 12, 1847.

A Review of Dr. M. Gay's Statement of Dr. C. T. Jackson's Claims to the Discovery of the Applicability of Sulphuric Ether to the Prevention of Pain in Surgical Operations. By J. B. S. Jackson, M. D. Boston Medical and Surgical Journal, June 30, 1847.

Account of a New Anæsthetic Agent as a Substitute for Sulphuric Ether in Surgery and Midwifery. By J. Y. Simpson, M. D., F. R. C. S. E., etc. New York, January, 1848. pp. 24.

Annual Report of the Trustees of the Massachusetts General Hospital, Jan. 26, 1848. Also, in Littell's Living Age, Vol. XVI. No. 201, March 18, 1848. Also, in American Journal of the Medical Sciences, Philadelphia, April, 1848, p. 493.

A History of the Ether Discovery. Edited by Richard H. Dana, Jr., Esq. Littell's Living Age, Vol. XVI. No. 201, March 18, 1848.

Etherization: a Compendium of its History, Surgical Use, Danger, and Discovery. By Henry J. Bigelow, M. D. Boston Medical and Surgical Journal, April 19, 1848, p. 229 and p. 254.

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Report to the House of Representatives of the United States of America, vindicating the Rights of Charles T. Jackson to the Discovery of the Anæsthetic Effects of Ether Vapor, and disproving the Claims of W. T. G. Morton to that Discovery. Presented to the House of Representatives on Aug. 28, 1852, by Hon. Edward Stanly of North Carolina, and Hon. Alexander Evans of Maryland, members of the Select Committee on the Ether Question. Printed by authority of the Committee. pp. 57.[2]

[1] Son of Horace Wells.

[2] Not presented to the House, for want of time, but certified to by the Clerk of the House of Representatives; consequently not a Public Document.

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THE END.